COAL MINING

MAY, 1953

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VOLUME 30, No. 5

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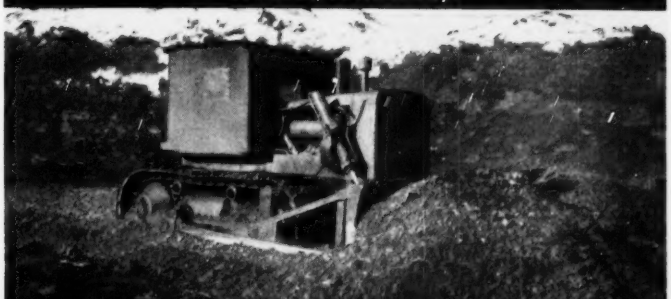
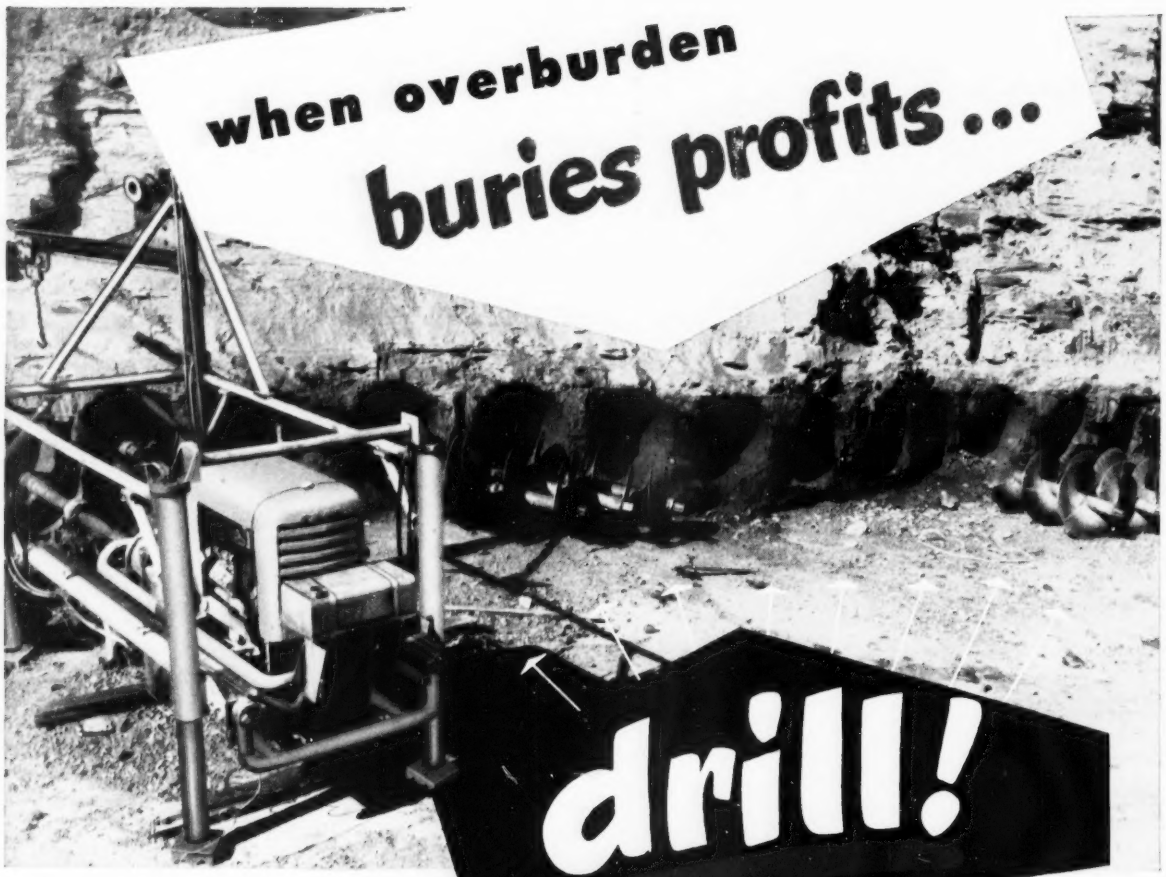
LIMA PAYMASTER speeds up production for HARBAUGH and KIMMEL, West Newton.

ALLIS-CHALMERS "D" GRADER builds roads at SPRING VALLEY COAL CO., Lumber City.

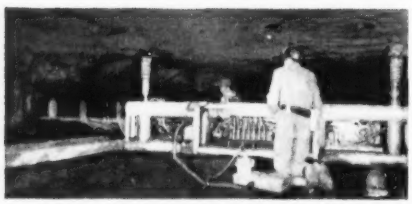


ALLIS-CHALMERS HD-20, operated by MATHEWS COAL CO., Grampian, is the toughest, strongest tractor ever built. It takes the loads of rush jobs . . . stands up under the most grueling operating conditions.



CARDOX Surface AUGER MINER

brings "dead" strip mines back to life . . .



CARDOX Underground AugerMiner

The practical answer for mines where seams or poor roof conditions make conventional mining unprofitable or unsafe. Write for Bulletin.

With a CARDOX Surface AugerMiner you can drill back 10 to 120 feet into coal seams buried by excessive overburden. The cost of salvaging this coal is normally only a fraction of that of the original working by conventional methods. The coal you left behind may be your highest profit tonnage!

CARDOX AugerMiners can be trucked or towed on their detachable wheels to any exposed face of coal. They are self-positioning to the height of the seam. Driven by a rugged 145 H.P. engine, augers up to 36 inches in diameter drill out clean, pure coal, ready for mechanical loading into trucks. Six-foot auger-sections are easily added or removed by the built-in retriever. Directional control keeps the auger boring into the best part of the seam, away from rock and shale.

Ask your CARDOX Representative for the Auger-Miner profit story. Or write for our AugerMiner bulletin.

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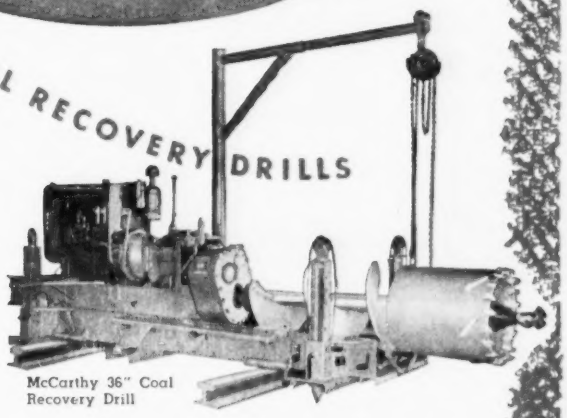
McCarthy drills CUT DRILLING COSTS

BLAST HOLE DRILLS

At Bessemer Limestone and Cement Co., Bessemer, Pa., one McCarthy Blast Hole Drill, like the one pictured below, averaged 90 ft. an hour, working through a hard blue shale facing 34 ft. deep. Holes were drilled on 18 ft. centers. Two men handled the whole job, including set-up and moving. Bessemer officials were so pleased with the performance of the McCarthy Drill that a second one was ordered and put to work in another section of their quarry. It, too, is breaking all previous records for fast, low-cost shot hole drilling.

COAL RECOVERY DRILLS



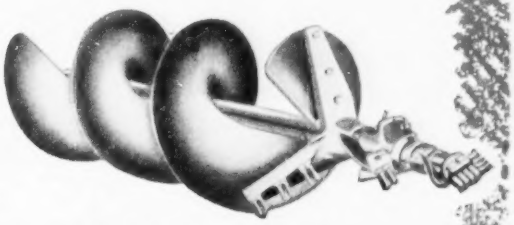
McCarthy 36" Coal Recovery Drill

Near Salineville, Ohio, a three-man crew, operating a McCarthy Coal Recovery Drill, similar to the one shown above, produced 90 tons of clean, high-grade and profitable coal in one eight-hour day. At Germano, Ohio, a three-man crew, using a 36" diameter auger section, produced 167 tons of coal in one eight-hour day!

Hydraulically controlled and operating on gasoline, diesel or electric power, rugged McCarthy Coal Recovery Drills produce coal at $1.50 to $2.00 a ton, including amortization of investment cost. You can select from four models . . . 20" to 24", 30" to 36", 42" and 48" diameters with 4-ft. to 24-ft. auger sections. Write Salem Tool direct and a distributor will call on you.

Heavy Rugged Powerful

McCarthy Model 106 Vertical Drill



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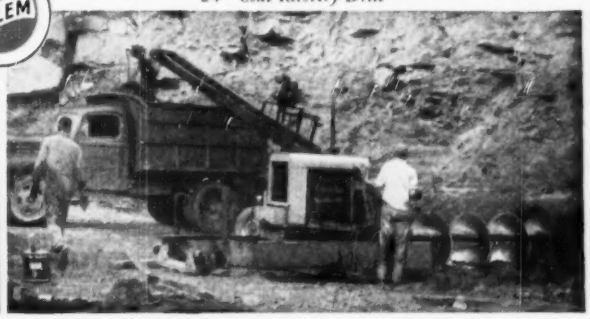
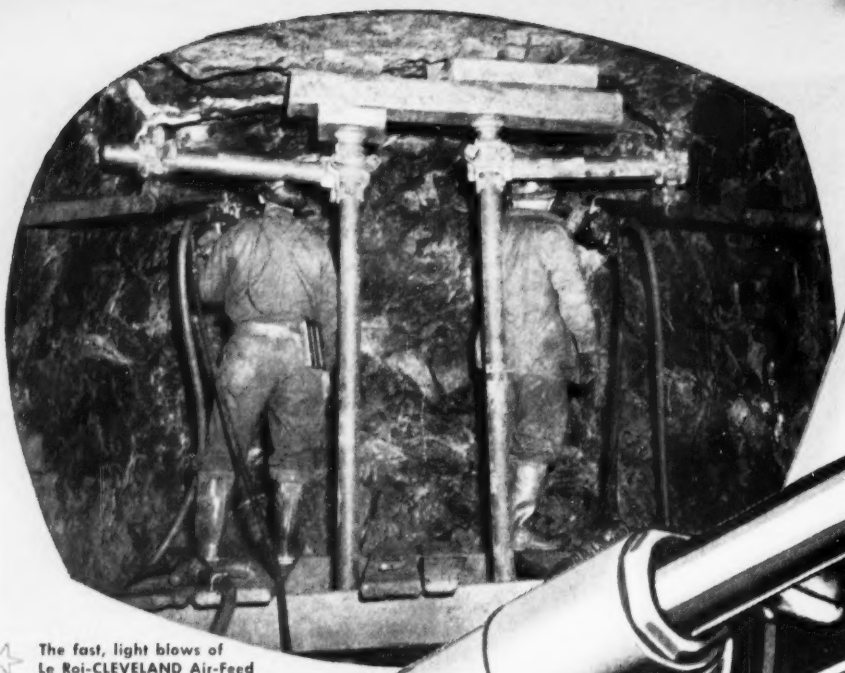
Self-propelled high-wall Blast Hole Drill

SALEM

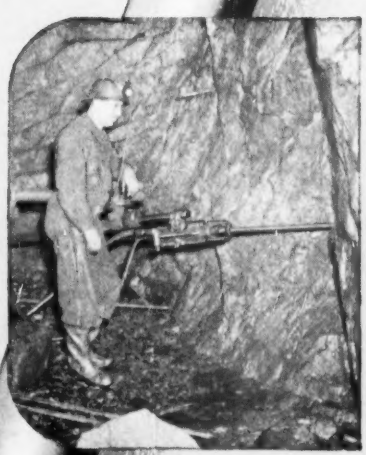
24" Coal Recovery Drill



Published monthly by Modern Mining Publishing Company. Publication Office—Advance Printing & Litho Co., Erie, Pa. Editorial and Executive Offices—4575 Country Club Drive, Pittsburgh, Pa., P. F. JASIK, Publisher & Editor. Price: In the United States, $2.00 per year; all other countries, $5.00. Single Copy, 50 cents. Entered as second-class matter at the Post Office at Pittsburgh, Pennsylvania, under the act of March 3, 1879. Application for reentry applied for at the Post Office at Erie, Pennsylvania.



The fast, light blows of Le Roi-CLEVELAND Air-Feed Drifters are just right for carbide bits. You get maximum bit life — can use smaller bits for higher drilling speeds.



Le Roi-CLEVELAND Air-Feed Drifters take the back-breaking work out of drilling horizontal holes.

The HC23 can be used with coupled steel to drill 70' holes — ideal for ring-drilling.

Tonnages go up!

Drilling costs go down!

with Le Roi-CLEVELAND Air-Feed Drifters

YOU lighten the load on miners — take the hardest part of the work out of drilling — when you equip them with Le Roi-CLEVELAND Air-Feed Drifters. Men don't tire so fast — safety records improve — tonnages rise.

Here are some reasons why: (1) You can use the Model 83 lightweight pneumatic air column to speed set-ups. (2) Fast reverse feed makes changing steels quick and easy. There are no swing or dump nuts to loosen or tighten. (3) Positive air feed gives right pressure for maximum drilling speed. (4) Fast, light blows are just right for carbide bits.

Le Roi-CLEVELAND Air-Feed Drifters are available in two sizes: HC10R with $2\frac{5}{8}$"-bore machine and HC23R with $3\frac{1}{8}$"-bore machine. See how either model gives you longer bit life, lets you use smaller bits for higher drilling speeds — helps you get higher man-shift production, greater safety, and lower drilling costs. Write for further information.

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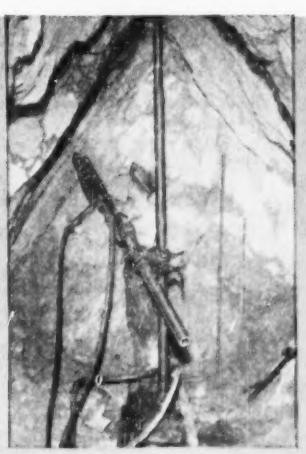
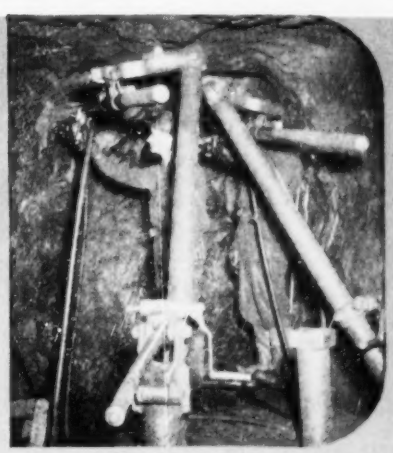
☆ Le Roi-CLEVELAND Air-Feed Drifter mounted on air-motor-powered boom of Le Roi-CLEVELAND Self-Leveling Mine Jumbo in a Western zinc and copper mine.



☆ Feed controls are conveniently located on Le Roi-CLEVELAND Air-Feed Drifters. Reverse air feed withdraws steel from hole quickly.



☆ The accent's on production in this mine. Le Roi-CLEVELAND Air-Feed Drifters make possible faster set-ups, faster steel changing, faster drilling.

RD-50

MAYHEW'S NEW HURRICANE

ROTARY AIR DRILL FOR BLAST HOLES IN OVERBURDEN

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BOOTH 440

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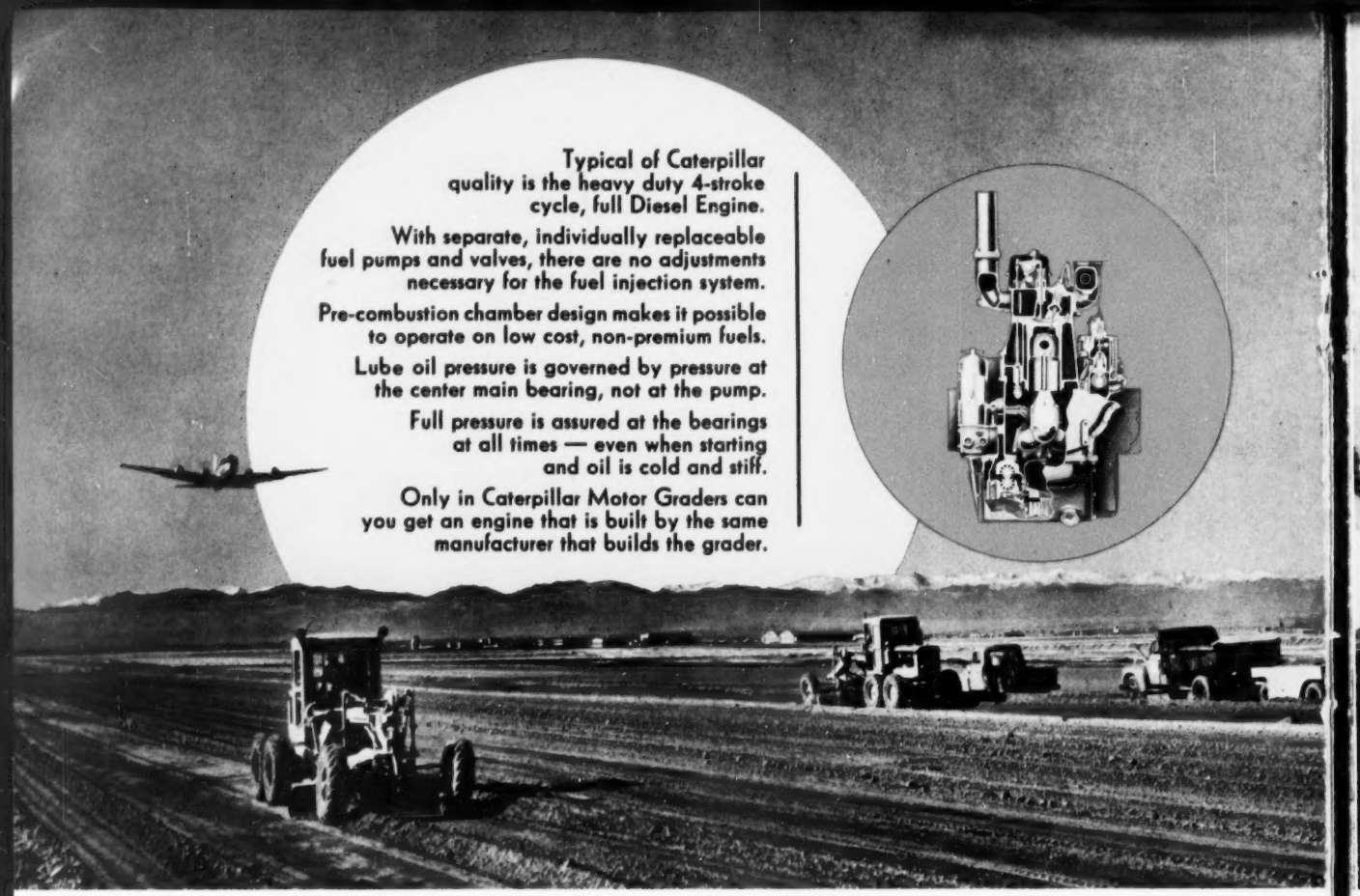
CATERPILLAR

LOOK TO THE DEALER BEHIND THE PRODUCT

DON'T MISS THE MESSAGE ON THE FOLLOWING PAGES ▶


Typical of Caterpillar quality is the heavy duty 4-stroke cycle, full Diesel Engine.
With separate, individually replaceable fuel pumps and valves, there are no adjustments necessary for the fuel injection system.
Pre-combustion chamber design makes it possible to operate on low cost, non-premium fuels.
Lube oil pressure is governed by pressure at the center main bearing, not at the pump.
Full pressure is assured at the bearings at all times — even when starting and oil is cold and stiff.
Only in Caterpillar Motor Graders can you get an engine that is built by the same manufacturer that builds the grader.

KEEPING COSTS

DOWN TO EARTH...

With a Caterpillar Diesel Motor Grader on your job, you can be sure of *lowest final costs* . . . lowest final costs that come from getting more work done with a minimum of down time — from a wider range of work performed with a minimum of operating costs — from a higher trade-in value with a minimum of maintenance costs during the Cat Motor Grader's many years of useful life.

You can be sure of *lowest final costs* because of Caterpillar's in-built quality — with engine, transmission and major Motor Grader components 100% designed and built by Caterpillar.

You can be sure of *lowest final costs* because of the unequaled parts and service backing supplied by your Caterpillar Dealer — with the trained and experienced personnel, ample parts stocks and specialized tools that can keep your Cat Motor Grader operating at top efficiency.

So let us show you in detail how Cat Motor Graders can serve you better — serve you longer — serve you at down-to-earth low costs. Just ask us for a demonstration.

LOOK TO THE PRECEDING AND FOLLOWING

PAYDIRT

ROLLS WITH THE PUNCH OF A CAT BULLDOZER

Watch a Cat Bulldozer at work. When the blade sinks in, the Caterpillar Diesel Tractor never stutters . . . lugging ability keeps the forward motion steady. The earth rolls up the blade and tumbles over itself. There's nearly half a century of research and experience behind Cat moldboard design . . . a design that rolls bigger loads faster . . . and for many more years. Cat Bulldozers are built with the fine quality that has made Caterpillar the leader in long-life performance!

The Caterpillar 'dozer blade curves in a natural arc to *roll the dirt* instead of pushing it. This action reduces pushing effort . . . builds up full-capacity loads each pass. Ample clearance behind the cutting edge allows small rocks to escape without stopping the blade's digging action.

The operator keeps constant command of every action through exclusive and fast-acting Caterpillar-built controls. Clear vision, fore and aft, boosts production and safety.

We'll be glad to show you the action of a Cat Bulldozer . . . just call us or drop us a line!

CATERPILLAR

LOOK TO THE DEALER BEHIND THE PRODUCT

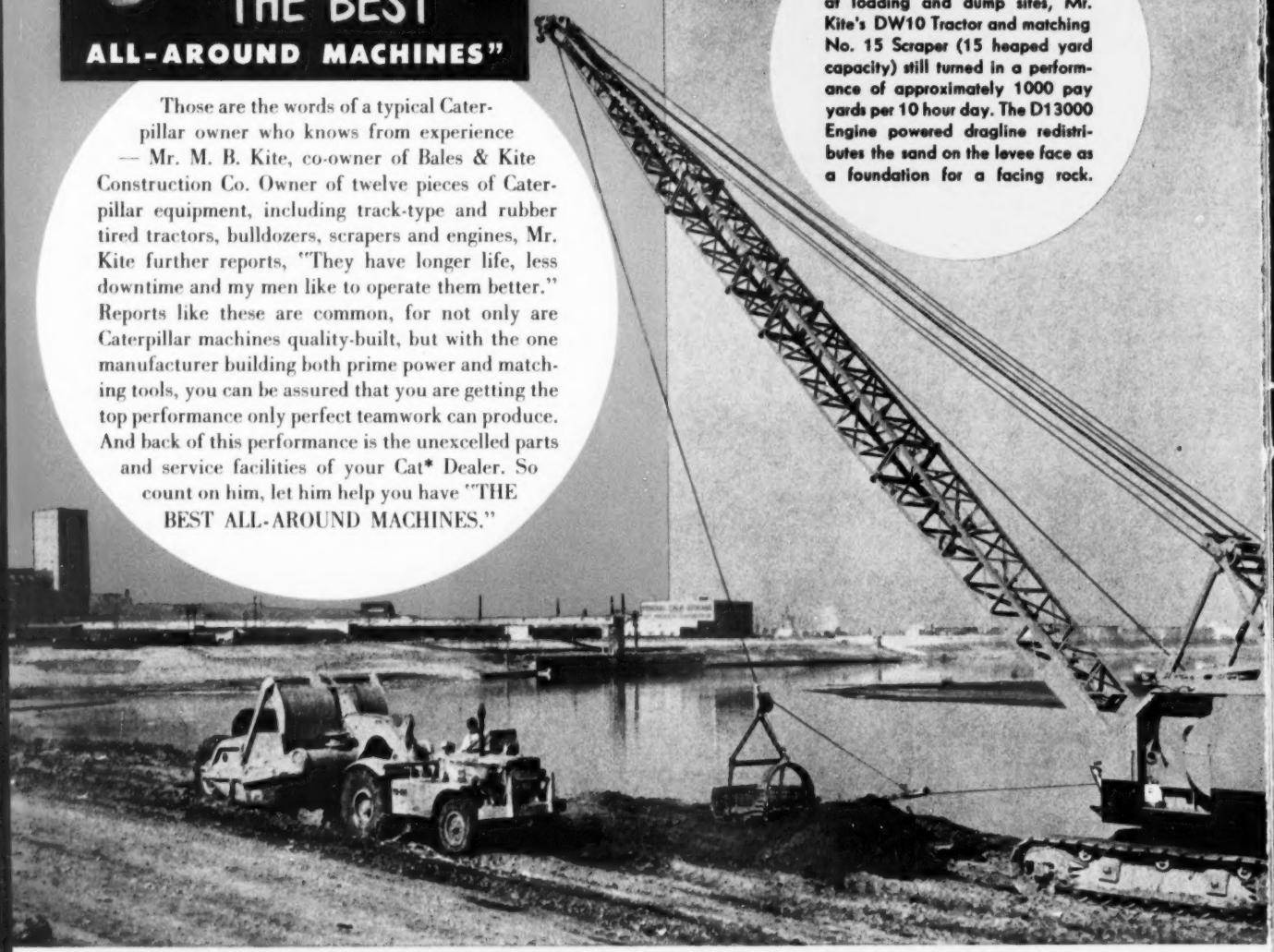
PAGES FOR YOUR DEALER'S NAME . . .

MR. KITE, co-owner of
Bales & Kite Construction Co

"THE BEST ALL-AROUND MACHINES"

Those are the words of a typical Caterpillar owner who knows from experience — Mr. M. B. Kite, co-owner of Bales & Kite Construction Co. Owner of twelve pieces of Caterpillar equipment, including track-type and rubber tired tractors, bulldozers, scrapers and engines, Mr. Kite further reports, "They have longer life, less downtime and my men like to operate them better." Reports like these are common, for not only are Caterpillar machines quality-built, but with the one manufacturer building both prime power and matching tools, you can be assured that you are getting the top performance only perfect teamwork can produce. And back of this performance is the unexcelled parts and service facilities of your Cat* Dealer. So count on him, let him help you have "THE BEST ALL-AROUND MACHINES."

Working in sand under difficult cycle conditions involving extra fixed time at loading and dump sites, Mr. Kite's DW10 Tractor and matching No. 15 Scraper (15 heaped yard capacity) still turned in a performance of approximately 1000 pay yards per 10 hour day. The D13000 Engine powered dragline redistributes the sand on the levee face as a foundation for a facing rock.



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CM-1

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COAL MINING

Vol. XXX May, 1953 No. 5

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Published Monthly By

MODERN MINING PUBLISHING COMPANY

Publication Office—1118 Chestnut St., Erie, Pa.

Editorial Offices—4575 Country Club Drive, Pittsburgh, Pa., Phone Pl. 1-9411.

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"Faster" on all tractor

says strip mine veteran

After 18 years of coal mine stripping and other dirtmoving, Ivan Wright, Peoria, bought his first rubber-tired Tournatractor last year. Now, with more than 2500 hours on this 19 mph rig, he says, "There's not a crawler-type machine made that will move the amount of dirt Tournatractor will." He cites these examples:

Stripping — On job pictured, Wright's Tournatractor stripped 40 ft. of overburden at Glasford, Illinois. Handling assignment alone, Tournatractor removed all slate and refuse including 1 foot of cap rock, leaving coal ready to be shot and hauled out.

Clearing — On a recent maintenance job — trimming road banks and clearing brush — Wright worked a crawler and Tournatractor side by side. "Tournatractor walked away from the crawler," he says. "Never found a tree Tournatractor couldn't take out . . . takes a tree up to a foot in diameter in one pass."

Pulling a scoop — For hauling dirt, Wright hitches his Tournatractor to a 15-yard scraper. On typical job, he averages 15 trips hourly (totalling 150 bank yards of clay) on 400′ cycles, according to time studies by Government Engineer. "Working with a scoop," says Wright, "you can load in 2nd gear and dump in 3rd . . . can double production of a crawler-pulled scraper. Tournatractor is the best rig to pull a scoop that I've ever seen or used." Rig has 186 hp with 4-wheel drive.

Dozing up steep grades — "Working in 6 to 7′ deep channel," reports Wright, "Tournatractor would come up 3-to-1 slopes with a load whereas crawler could not make the slopes without a load." (Tournatractor's constant-mesh transmission lets you change speed under load without loss of vital momentum . . . 186 hp and 4-wheel drive on big high-traction tires give you plenty of power to doze up steep, slippery grades.)

LETOURNEAU LET EQUIPMENT

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(Pottsville Region)

Removing overburden at mine near Glasford, Tournatractor, working with dozer blade, strips 40 ft. of clay, sand, shale and soapstone, moving overburden an average of 200 ft. One foot of cap rock was also removed by this Tournatractor, leaving coal ready to shoot and haul out.

jobs...

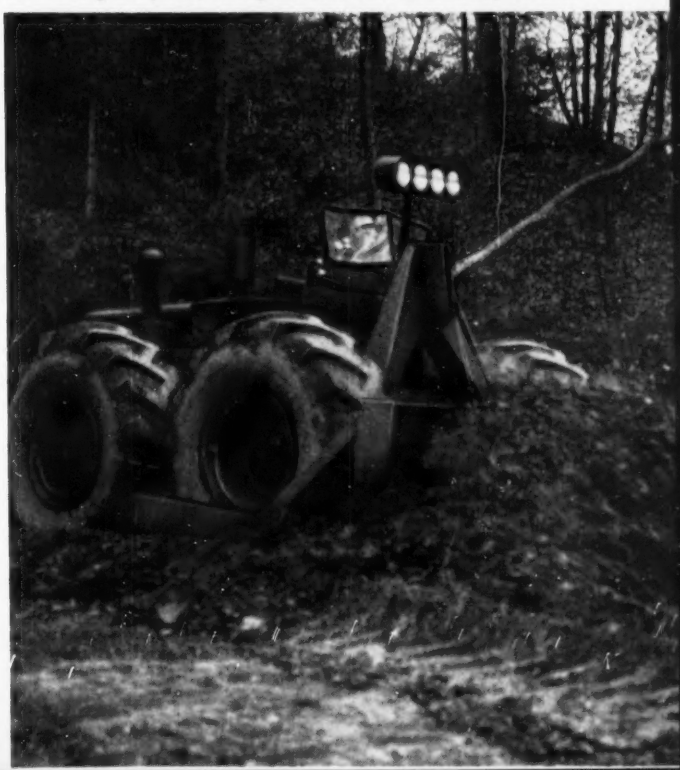
Job-to-job moves — In 2500 hours of scattered assignments, Tournatractor has never been on a trailer. It travels any time, anywhere, under its own power at speeds to 19 mph . . . eliminates loading, blocking . . . makes fast moves job-to-job or between neighboring spreads. "Up to 50 miles, you can move Tournatractor as fast as you can a crawler with a truck," says Wright.

Ease of operation — Based on many years' experience with crawler rigs, Wright now says, "Tournatractor is much easier to operate — no work to it." No wasted time or effort clutching . . . Tournatractor changes speed instantly with movement of speed selector switch, eliminates clutching completely. Big low-pressure tires take up shocks of uneven ground . . . save wear and tear on operator as well as machine.

Be your own judge of what Tournatractor can earn on your spread. To make estimates, ask your LeTourneau Distributor for owner-verified field reports covering all types of working conditions . . . or have him demonstrate one of these high-speed rubber-tired tractors in your pit. Meanwhile, write direct for bulletin TD-117 describing design and construction.

Tournatractor—Trademark D-145-CM-w

After 2500 hours, Tournatractor tires still have about 85% of original tread. During this period, the rig has been 95% mechanically efficient.



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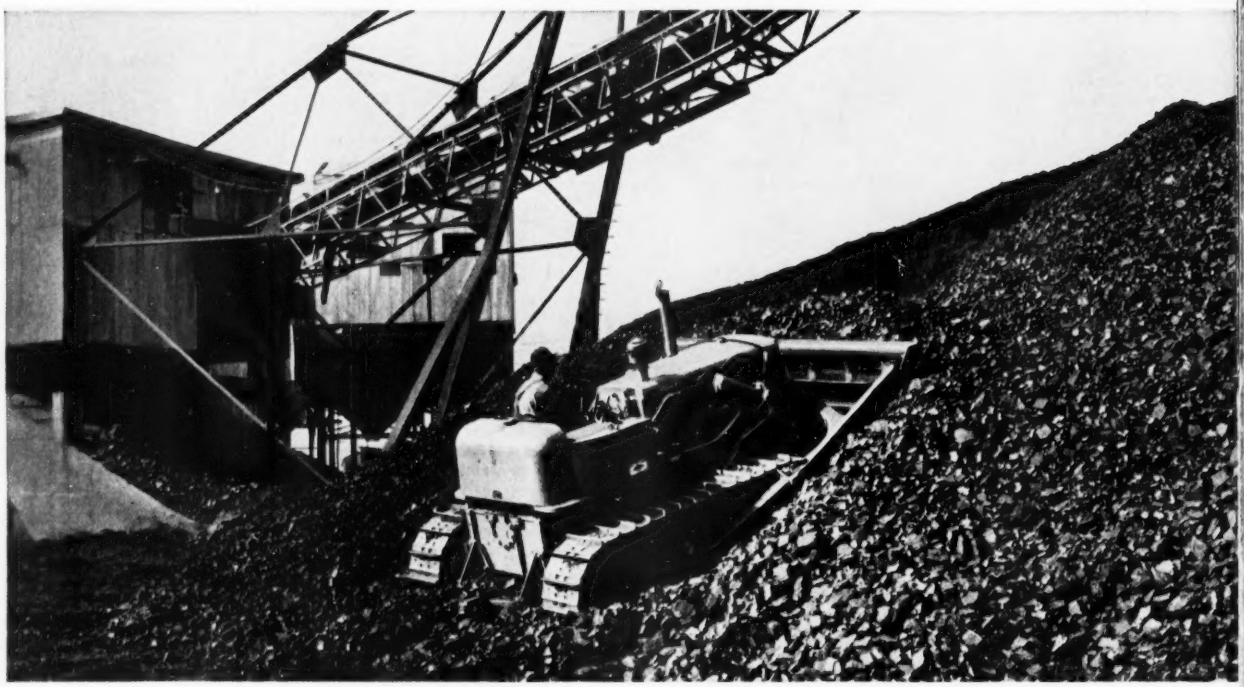
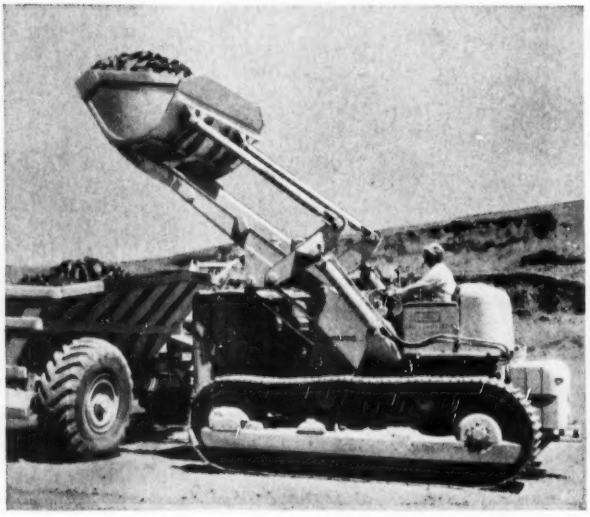
NEW TRENDS IN MINING MECHANIZATION



Maintains Coal Stockpiles At Mine. HD-9 Tractor also handles stripping, cuts drainage ditches, feeds and cleans up around shovels, tows equipment. Wide range of bulldozers — straight or angled, cable or hydraulic — assures the right combination for every job. Each is designed to retain tractor balance and accessibility.

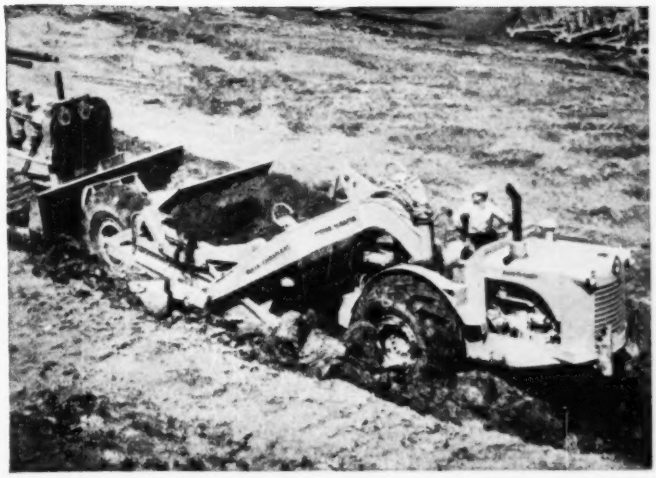


Loads Hauling Units. HD-20G Tractor shovel loads coal, overburden, other bulk materials — four cubic yards at a scoop. With 175 net engine horsepower, it has the excavating ability to load coal right out of some seams without blasting.

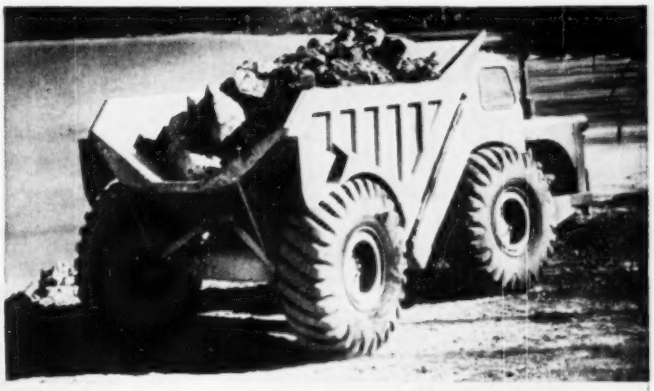
Builds and maintains haul roads. AD-40 Motor Grader levels pit bottoms . . . digs and grades for drainage . . . scarifies . . . prepares dragline sites. Gasoline-powered Model D Grader also available. Handles routine road maintenance — light construction, etc.

TODAY'S demands on mining production require the selection of equipment of the broadest versatility. Allis-Chalmers offers a complete range of material moving and handling equipment — including four sizes of diesel crawler tractors, motor graders, pull scrapers, high-speed Motor Scrapers and Motor Wagons — designed to fit your particular mining applications and to deliver the highest possible output.

Here are some on-the-job views with a few of the many ways in which these modern machines are speeding production and lowering costs.



Strips overburden. 13-yard heaped capacity TS-200 Motor Scraper also loads, hauls material from open pit . . . clears and levels for camp sites and drill setups . . . levels and grades building sites . . . hauls in supplies. Larger 18-yard heaped capacity TS-300 also available.



Hauls rock overburden. TR-200 Motor Wagon body is interchangeable with TS-200 Motor Scraper body. Unit travels fast "off-road" with capacity loads . . . dumps clean every time with 18-ton, hydraulic-controlled rear-dump body. Sides channel-ribbed for rigidity.

Tractor-Scraper Team. HD-20 Tractor with pull-type scraper loads and hauls coal — handles large-scale stripping jobs. Exclusive Allis-Chalmers hydraulic torque converter on HD-20 gives higher output, less upkeep on pulling, pushing and dozing work.

Complete line of pull-type scrapers available, from 2-yard to 18-yard sizes.

Your Allis-Chalmers dealer will be glad to analyze your equipment needs and help you select the right machines for your jobs. See or phone him soon to watch these machines in action.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

BOWDIL

COAL CUTTER CHAIN and BITS

ONE-PIECE BIT HOLDER

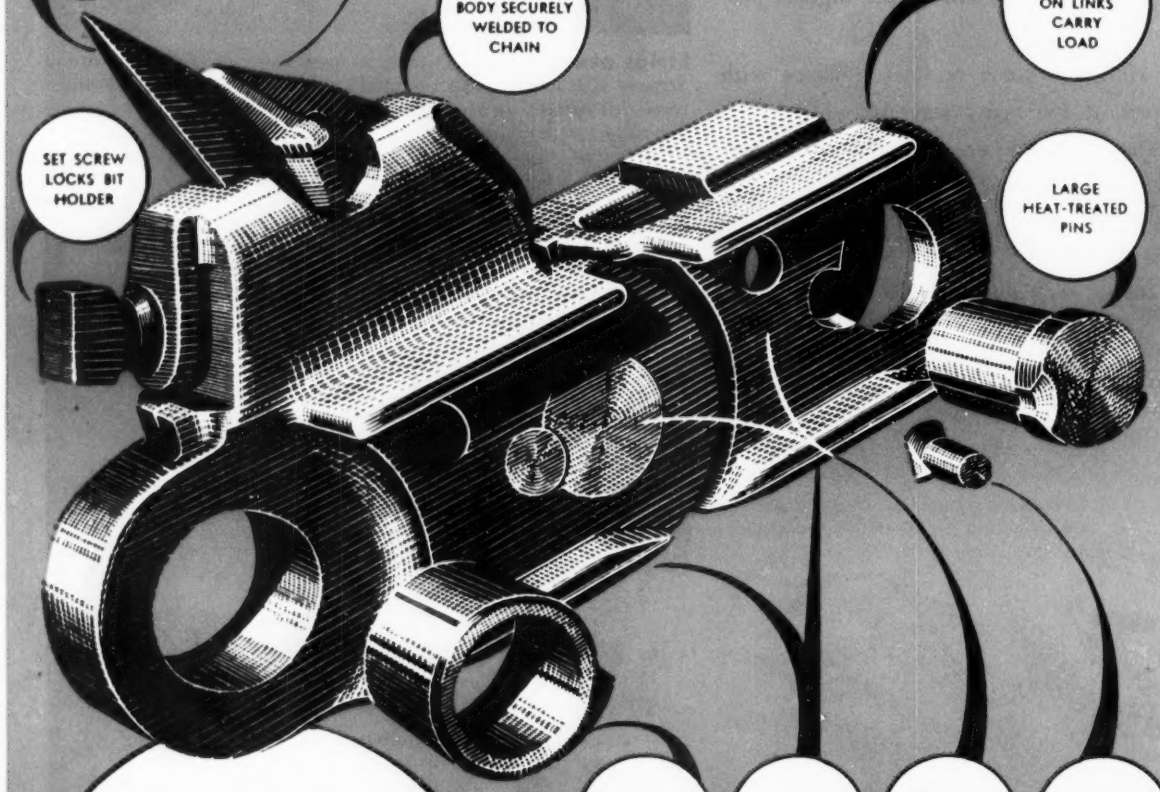
BOWDIL BITS

BIT-CARRYING BODY SECURELY WELDED TO CHAIN

HEAVY SHOULDERS ON LINKS CARRY LOAD

SET SCREW LOCKS BIT HOLDER

LARGE HEAT-TREATED PINS



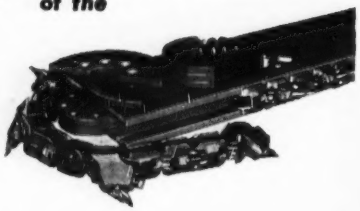
HEAVY-WALL HARDENED BUSHING

RADIAL TRACK GUIDES

DROP-FORGED LINK AND CONNECTOR

INGENIOUS RIVET LOCK

Made by the makers of the



STRONGEST CUTTER-BAR IN THE COAL INDUSTRY

SEE BOWDIL'S NEW 1-29 BIT AT THE SHOW • Booth 1006

THE BOWDIL COMPANY

CANTON, OHIO

Here and There in the Coal Industry

● Mr. L. M. Case has been named Assistant Manager of Rock Drill Sales for Le Roi Company, Milwaukee manufacturer of internal combustion engines, and construction and mining equipment, according to R. R. Morgan, Vice president in charge of Le Roi's Cleveland Division.

During World War II, Mr. Case was chief of the Mining Machinery Section of the War Production Board. In 1951, Case was recalled to Washington, first as Chief of the Mining Machinery Section of the Defense Materials Administration and later as Director of the National Production Administration.

● Preparing for the 1953 National First-Aid and Mine-Rescue Contest at Fort Wayne, Ind., Sept. 29-Oct. 1, the U. S. Bureau of Mines released a complete report describing how the highly successful 1951 event at Columbus, Ohio, was organized and conducted.

The 1951 contest, the first in 21 years, was held at the Ohio State Fairgrounds under auspices of the Bureau of Mines and the Joseph A. Holmes Safety Association. It was the 14th in a series that began in 1911.

Bureau Director J. J. Forbes said the new publication will be valuable to the many teams which will participate in the 1953 contest and likewise will help guide other employees, supervisors, and operators interested in promoting safety in the mineral and allied industries, including petroleum. The report gives specific recommendations for the contest scheduled at Fort Wayne this fall.

● Jason C. McGuire has been named Southern District Representative by Schroeder Brothers, Pittsburgh manufacturers and distributors of mine equipment and supplies. He will handle sales in Southern West Virginia, Eastern Kentucky and Western Virginia.

Before joining Schroeder Brothers, Mr. McGuire was an inspector and examiner with the West Virginia Department of Mines, following which he was a salesman for the Mining Division of Kennametal, Inc. During the past war he was an engineering officer in the Army Air Corps.

● Euclid-Memphis Sales, Inc., announces the establishment of a subsidiary firm in Arkansas to provide better service for Euclid owners in the state.

The new firm will be known as Euclid-Arkansas, Inc., with headquarters at 702 West Second St., North Little Rock. It will provide sales and service throughout Arkansas with the exception of six counties directly opposite Memphis. These are Mississippi, Cross, St. Francis, Lee, Phillips and Crittenden counties. The phone number of the new concern is 5-8482.

President of Euclid-Arkansas is R. A. Trippeer. Operations will be under the supervision of J. C. Mitchell, Vice President and General Manager. R. T. (Bobby) Vawter will be Parts Manager and R. M. (Bob) Greer, Service Manager. Worthington Brown is Secretary and Treasurer. Sales will be handled by Mitchell and Dan Carragher.

● Pennsylvania Pump and Compressor Company of Easton, Pennsylvania announces the publication of a comprehensive six-page catalog which briefly describes its line of Air and Gas Compressors, OILFREAIR and OILFREGAS compressors, Dry Vacuum Pumps, Aftercoolers, AIRCHEK valves and Centrifugal pumps for boiler feeding, general power plant and industrial applications.

Known as Bulletin 546, this catalog is printed in three colors and contains pictures of each member of the PENNSYLVANIA line together with a brief description, capacities and sizes. This Bulletin 546 will be furnished to any interested parties upon request.

The design is a service to that portion of the public which is in the market for a range of machinery manufactured by PENNSYLVANIA. Intended to simplify the selection of machines which may serve, this Bulletin 546 wil be found very useful.

COAL ASSOCIATION SECRETARIES' CONFERENCE, Washington, D. C., March 19-20, being addressed by Robert E. Lee Hall (standing), NCA counsel, with John D. Battle, (back to camera), assistant to president, National Coal Association, presiding. Others in the picture, left to right, are G. Don Sullivan, staff assistant, NCA Production Promotion Committee; Harry S. Homan, executive secretary, Southern Appalachian Coal Operators Association; H. J. Goudelock, executive secretary, Midwest Coal Traffic Bureau; Truman J. Johnson, secretary, Northern West Virginia Coal Association; James H. Cunningham, BCI staff; George H. Esser, president Virginia Coal Operators Association; Ezra Van Horn, executive vice president, Ohio Coal Association; C. W. Davis, executive secretary, Big Sandy-Elkhorn Coal Operators Association; George S. Ward, secretary, Harlan County Coal Operators Association; J. W. Colley, secretary, Logan Coal Operators Association; W. C. Gill, president, Coal Producers Association of Illinois; E. H. Miller, secretary, Ohio Coal Association; Fred S. Wilkey, secretary, Illinois Coal Operators Association; A. J. Christiansen, secretary, Illinois Coal Strippers Association and Northern Illinois Coal Trade Association; H. F. Cholet, Belleville Fuels, Inc.; John D. Amos, attorney, Northern West Virginia Coal Association; and Hal M. Scott, secretary, New River Coal Operators Association and Winding Gulf Operators Association. More than 25 attended the two-day meeting of regional and local coal trade executives.

The new Jeffrey Colmol operating in the Number Fifteen Mine of the Barnes & Tucker Coal Co. in the Northern Cambria Field of Pennsylvania

● Because of the nature of the coal mining industry, it in particular should get behind science and the scientist. The object of science is the pursuit of knowledge, in the past for the sake of knowledge alone, now for the sake of helping man attain things he needs and wants.

Science is constantly trying to learn more about nature, facts and principles that govern the physical world and the men who live in it. That great body of knowledge we now have about nature, accumulated over the ages, was given us by science. It is this knowledge that has enabled man to develop useful things for his comfort and happiness as well as to relieve him of slavery which in turn gave him the many luxuries he now has.

Engineering has been taking knowledge discovered by science and using it to design better structures, better bridges, better automobiles, radios, television sets.

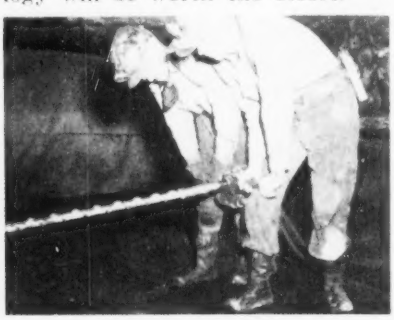
Recently we acquired the technologist, who by using the knowledge that scientist have produced for him, is bringing into being new techniques that are helping give man what he wants at a particular time.

Techniques developed over the past 50 years have advanced human welfare from 8 to 10 fold, but we are just beginning to learn about the facts of nature and how to use those facts to devise newer things and to develop better techniques. There is no historical, no scientific, no mathematical reason why advancement in scientific and technological progress should not be accelerated in the next 50 years.

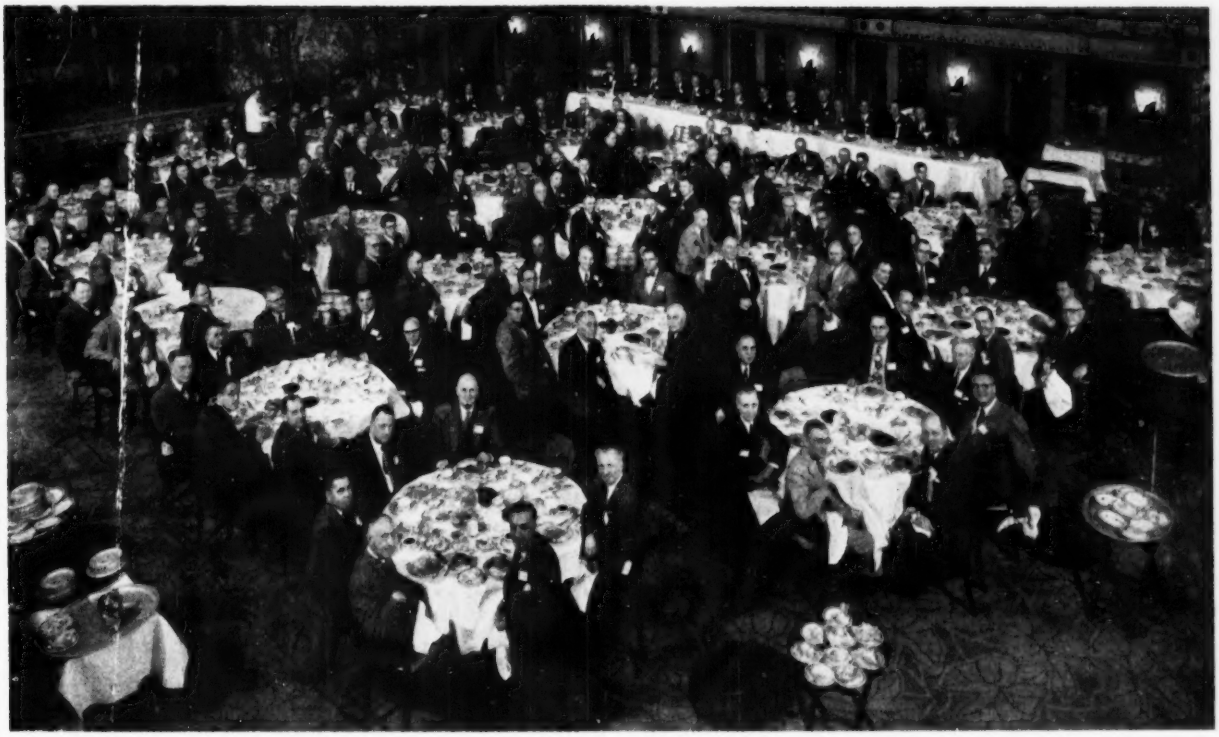
In the coal industry we are particularly interested in technology. Being a root of science, to predict overall trends of technology at this time would be difficult. There are, however, trends that indicate the coming era will be much more productive. We see these trends in CYBERNETICS—a study of communication and control mechanisms, including the mechanical and electronic brains which will speed technical progress. And SEMANTICS — a field that deals in how we know and what we know. There is also CHEMISTRY — when chemistry passes its trial and error stage, mathematical chemists will not only design new materials but will predict their properties and tell engineers how to make them.

For the supervisory executive in industry, the immediate future will call for the most exacting supervision in the history of mankind. For the supervisory executive the immediate future will be rough and cruel and only the brilliantly-strong will survive. Executives need not be concerned, however, not if their kin were leaders up to now. If so they are where they are because they carry genes of uncountable ancestors who fought and won against all the odds to date. The luxury and tranquility resulting from technology will be worth the effort.

The cutting end of the Jeffrey Colmol at the Barnes & Tucker Coal Co.



A new hydraulically operated coal drill made by the Schroeder Brothers of Pittsburgh. This drill has plenty power, no kick or shock, no spark and is light in weight.



Research, coal, railroad, and equipment company executives attend the annual luncheon of Bituminous Coal Research, Inc., March 6, 1953, at the Netherland Plaza Hotel, Cincinnati, Ohio.

Some Highlights of the Annual Members Meeting of the Bituminous Coal Research, Inc.

The Annual Meeting of the Bituminous Coal Research, Incorporated was held at Cincinnati, Ohio, March 6. Following are highlights of papers that pertain to the production of coal.

Remarks by A. A. Potter, President, BCR

While long range prospects are encouraging, the fact remains that for the past 40 years, the tonnage production of bituminous coal has failed to increase materially and has averaged 486 million tons per year, with only temporary upswings due to wars and declines resulting from depressions. Yet during those 40 years, the demand for fuels in this country has more than doubled because of industrial expansion and population growth. All of this increase has gone to competitive fuels, which have captured most of the increase in fuel demand by vigorous research and engineering in every phase of their business and by aggressive merchandisng policies. The bituminous coal industry has invested in its research agency, BCR, only 1/51 of one per cent of its gross income, and this has included its General Program as well as the Locomotive Development and the Mining Development Programs. The petroleum industry is reported to have 15,000 people working on research of value to that industry, at a cost of more than 120 million dollars per year. A recent survey of the present status of coal research by J. W. Igoe and H. J. Rose, of the BCR Staff, disclosed that research on coal, its production and use is being conducted now by fewer groups than was the case two years ago when a similar study was made.

It is a fact that the bituminous coal industry is carryiny on too little research in relation to its importance as a source of heat, power, and chemical products. At the Annual Meeting of BCR a year ago, its members endorsed plans for an enlarged and better-balanced program of research, development, and technical promotion, but the disturbed conditions of the past year in the coal industry have retarded the support of this so-called "Plan of Action Program."

It is true that about 65% of the present fuel consumption by electric power utilities is coal and that about 65% of the new electric power plants are being designed to burn coal. It is well, however, for us not to forget that even in the electric power utility field, coal's percentage has been declining, and that many coal-burning plants are equipped with conversion burners to use oil or gas if it is economical to do so. It must also be realized that commercial power production from atomic sources is a threat to the bituminous coal industry in connection with its electric power utility market, particularly if the by-product from breeder reactors, plutonium, can be sold at a fair price for military purposes. Current active research on breeder reactors and

Left to right: A. W. Holmes, Asst. Sales Manager—Mining, Link Belt Company, John P. Reese, Engineer, Sinclair Coal Company, and W. H. Brackmann, Fuel Engineer, Pittsburg and Midway Coal Co., order BCR publications during the annual meeting of Bituminous Coal Research, Inc., March 6, 1953, at Cincinnati, Ohio. C. E. McGlaughlin, Special Representative of BCR at the right describes contents of the publications.

A. A. Potter, President BCR signs agreement between BCR and American Locomotive Co., to carry on stepped-up developmental program on coal burning gas turbines. Left to right: P. R. Broadley, Assistant Director of Research, BCR Locomotive Development Committee, W. A. Callison, Vice President, American Locomotive Company, and John I. Yellott, Director of Research, BCR Locomotive Development Committee witness the signing.

the growing uses of plutonium make it essential more than ever before for the coal industry to protect its future in the utility field by more active research programs in coal mining and utilization.

Markets Through Cost Reduction

By L. Newton Thomas
President The Carbon Fuel Co.

Modern coal preparation plants are doing much to deliver what the customer wants, yet much remains to be done if we are to produce a product to compete with certain features of our principal competitors, oil and gas. Barring car shortages and strikes, the railroads can deliver the product when and where the customer wants it.

Furnishing the product profitably and at a price the customer is willing to pay is another story. While we have made gradual progress, taking such machines as the manufacturers bring out, and trying to adapt them to our mining processes, many large blocks of tonnage have been lost by the coal industry in recent years, not because of any inherent lack of qualification in coal, but because it costs more than adequate substitutes.

There are two reasons for this. First, the cost of transportation has steadily increased. Despite the fact that we were told by the railroads that their adoption of the diesel engine would result in substantially lower costs, we have not yet seen these lower costs reflected in lower rail rates. Parenthetically, here is a case where a large coal tonnage was lost to an adequate substitute.

When you consider that freight accounts for an average of 39% of the delivered price of coal, the importance of this factor on future markets can hardly be over emphasized.

The second factor in delivering the product at a price the customer is willing to pay is, of course, the cost of removing the coal from the seam, processing it and loading it into railroad cars. Although our progress here has not been sufficient, consider that when the idea for the Mining Developmnt Program was advanced by the staff of Bituminous Coal Research in 1946 and 1947, the problem was considered of such little importance by the majority that the basis on which the program was established was that it would not use any of the funds then subscribed.

If, however, sufficient funds

A. A. Potter (standing) President of Bituminous Coal Research, Inc., presents first annual BCR award to R. H. Sherwood, President of Central Indiana Coal Co., (center) for outstanding leadership on behalf of industry-sponsored coal research. L. Newton Thomas, President of Carbon Fuel Company, is seated next to Mr. Sherwood.

Dr. E. R. Weidlein, President, Mellon Institute, Pittsburgh, delivers the annual luncheon address. Left to right: W. A. Callison, Vice President, American Locomotive Company, Dr. H. J. Rose, Vice President and Director of Research, Inc., E. R. Weidlein, and R. H. Sherwood, President, Central Indiana Coal Company.

Dr. H. J. Rose, Vice President and Director of Research of Bituminous Coal Research, Inc., describes the status, accomplishments, and opportunities of research projects under the BCR General Research Program.

Walter J. Tuohy, President, Chesapeake & Ohio Railway Company, describes progress under the Locomotive Development Program.

H. John Harper, General Manager of Mines, Eastern Gas & Fuel Associates, discusses the importance of coal research to progress of the industry during the annual meeting of members of Bituminous Coal Research, Inc., March 6, 1953, at Cincinnati, Ohio. His subject was "Coal Utilization Research."

were obtained from a special subscription, the program would have to be set up separate and apart from the General Program, which was and is almost exclusively devoted to coal utilization. Let me give you an example of what cost reduction can mean to markets. I have here in my hand a piece of metal, silver in color. At one time it was so rare that Napoleon had his tableware made of it, for State occasions, in preference to gold. When the Washington monument was completed, this metal was so rare and expensive that it was used as a fitting cap-piece for this beautiful monument.

Later, a fairly inexpensive process was evolved for the production of this metal and by 1915 it had ceased to be a jewelry metal and was selling at the rate of 45,000 tons per year at 60 cents per pound. Further, cost and price reduction created new uses, and in 1948 over 600,000 tons were sold at 15.7 cents per pound. From 1943 to 1948, when prices generally were going up, the price of this metal, aluminum, went down from 17 cents per pound to 15.7 cents per pound.

Admittedly the growth of the aircraft industry contributed to the demand, but how about the substitution of aluminum for copper. The use of aluminum for transmission lines started after the war and now represents 6% of the total aluminum used. In the period from 1945 to 1948, 1,500,000 miles of aluminum transmission wires have been installed. Now aluminum is being used in many places to displace lumber.

What happened to coal as a result of the aluminum expansion? Well, in one instance the combined cost of producing and delivering coal caused the Aluminum Corporation of America to produce electricity for one plant at the rate of 120,000 K. W. with 120 spark fed, natural gas, internal combustion engines driving electric generators.

This is another piece of metal, iron or steel. In the early part of the 1800's rolled iron plate sold for $350.00 per ton, and because of its high cost was used principally for making nails and other fastening devices. In 1880 about one million tons of iron and steel were produced and sold at $86.00 per ton. In 1948 over 90 million tons were sold at about $50.00 per ton.

Many of us heard last year Mr. Cisler of Detroit Edison speak of the tremendous expansion in electric power generation now in process. At the same time he laid great stress on the need for finding ways to ship a lower priced fuel from the mines to the purchasing plants.

Left to right: R. D. Stockdale, President of Red Jacket Coal Corp., Harry Ballman, Smoke Inspector, Columbus, Ohio, and J. E. Atchison, Dir. of Engineering, Iron Fireman Manufacturing Co., meet at close of morning session.

Left to right: R. Tom Sawyer, Director of Research, American Locomotive Company, P. R. Broadley, Asst. Director of Research, BCR Locomotive Development Committee, and W. A. Callison, Vice President of American Locomotive Company, register for annual meting.

Robert G. Pfahler, Consulting Engineer, The Berwind-White Coal Mining Co., and George Kennedy, Preparation Engineer, Rochester and Pittsburgh Coal Co., register for annual meeting of Bituminous Coal Research, Inc., March 6, 1953, at Cincinnati, Ohio. Both men are members of BCR technical committees.

S. S. Nicholls, Vice President, C. H. Sprague & Son Co., W. R. Graham, Vice President, Pocahontas Land Corp., and H. R. Hawthorne, Chm. of the Board of Pocahontas Fuel Co., Inc., get together during the annual meeting of Bituminous Coal Research, Inc., March 6, 1953, at Cincinnati, Ohio. Mr. Nicholls is a member of the Board of Directors of BCR and Mr. Hawthorne is a member of the BCR Locomotive Development Committee.

One of the great chemical companies which now uses gas for its raw material, has for several years been conducting research upon converting coal to old and new chemicals. It has recently invested 10 million dollars in a pilot plant to further develop the process. This plant uses 300 tons of coal per day. To take care of the needs of the South Charleston plant alone, it has been estimated that 5,000 tons of coal per day may be consumed. This is a new use for coal. In a recent talk explaining the huge potentialities are largely based on a greatly reduced price for coal—as much as one to two dollars per ton.

To prove this can be done, this progressive company — Carbide and Carbon Chemicals Co. — though having had no previous mining experience, has developed its own continuous mining system. If a chemical company has this much vision and faith in coal, why can't we? If we don't we may find other larger consumers buying coal land to be in position to operate their own mines as this company has done.

We have of necessity given so much time and effort to getting the best possible price for coal, we have, in my opinion, too seldom thought in terms of increasing our markets by cost reduction.

We see little evidence of many leading coal executives giving adequate recognition to the possibility of mining research as a mechanism to increased markets. Yet there are many areas wherein coal no longer has an economic advantage. To the contrary, it now has in areas such as Columbus and Detroit, an economic disadvantage.

It seems to me in recent years we have been meeting our adversaries with purely defensive strategy. When cheap oil invades our seacoasts we go after legislation to limit it. As gas spreads farther and farther from its points of origin we try to stop its encroachment by an appeal to the F. P. C. I am not criticizing this action. It is desirable. But if we lose these political and economic battles we have nothing to fall back upon because we have done too little to strengthen our competitive postion by better methods and equipment. What are the possibilities for meeting these challenges? Are they real? And what has the industry done to take advantage of the possibilities? It seems to me we have not done enough compared to the opportunities for doing much. Over the period of 1948 to the present, a little over four years, the Mining Development Program has received from direct subscriptions from the industry, an average of $125,000 per year or 29 thousandths of one per ton of production.

L. C. McCabe, Chief, Fuels and Explosives Division, U. S. Bureau of Mines, and Gerald von Stroh, Director of Develpoment, BCR Mining Development Committee, discuss mining research during the annual meeting of Bituminous Coal Research, Inc., March 6, 1953, at Cincinnati, Ohio.

Opportunities in Continuous Mining Research

By G. von Stroh
Director of Development, Mining Development Committee

At the expense of being repetitious, I would like to first say, that what the industry needs is a continuous mining system rather than merely a continuous mining machine.

Is such a system possible? Has it ever been achieved? If so, what was involved in achieving it?

To the best of my knowledge, there is in existence only one continuous mining system. In many respects, it leaves much to be de-

sired, but nevertheless its results are amazing.

I am, of course, referring to the mining system for mining coal developed by the Carbide and Carbon Chemicals Company and rather widely publicized in recent issues of the Coal Trade Journals.

This system was devised to meet a specific set of conditions and consequently its general use by the industry is quite limited. However, the cost of producing coal by this system permits a direct face labor cost of as low as 10 to 15c per ton as compared to better than $1.00 per ton by usual methods, or a cost reduction in the order of $1.00 per ton.

There is no reason to believe than an even more efficient system could not be evolved and one which would be applicable to virtually all mining conditions. But what would be required to evolve such a system?

First, would be capital and lots of it. Unofficially, I have been informed that Carbide and Carbon has spent better than $2,000,000.-00 in developing their present limited system.

It is to be expected that a more universal system would require at least twice as much or $4,000,000.-00.

This would need to be patient capital, about six to eight years worth of patience. Carbide has been working on their system since 1946 or about six years and still have quite a bit to do, probably another one to two years to perfect their system. As Mr. Thomas has pointed out, it is only reasonable and common sense to expect that such a program under BCR would give the greatest results per dollar invested. Most of the basic elements of such a system already exist, but need to be modified and adapted to the needs of the mining industry. This is rather well indicated by the fact that for all practical purposes, the Carbide system does not represent any basically new inventions.

The BCR Burster Mining Head applied to such a system should produce a size realization as good or better than present mechanical mining as compared to 40% minus $\frac{1}{4}$" produced by the Carbide system.

In my opinion at least, the time has come when it is absolutely necessary to forget traditions and traditional methods and really start a creative revolution in the mining of bituminous coal. The Carbide system has certainly shown what a lack of regard for tradition can do.

The industry has no assurances that the oil and gas industry will cease and desist dumping their products at unrealistically low prices. We, therefore, have no basis for expecting our competitors to freely give back to coal an economic advantage. Quite to the contrary. Performance of the past indicates that oil and gas industries will do their most to obtain further economic advantage to themselves. The coal industry can either sit back and watch its markets dimish and operations become increasingly marginal or they can, on a realistic basis set out to meet this economic challenge with a fair expectation of adequate results.

I do not mean to infer that the coal industry will go out of existence. Far from it. There will always be some market for coal, but whether it is a good and profitable market or not, will be largely dependent upon the industry's ability to sell at a profit, at a price the customer is willing to pay. I personally, have not written off the 70 to 80,000,000 ton domestic market. But the cost of coal as compared to the cost of gas or oil is certainly as important to the retention of this market as is providing equal conveniences.

The future for coal is potentially bright and optimistic, providing we do not continue to lose ground. But remember, practically any worthwhile development requires from 6 to 8 years from its start to the beginning of its commercial return. There is no reason to believe the coal industry can shorten this period. So, in deciding what you do today, look, if possible, at your expected needs, not next year but six to eight years from now. Mr. Thomas has pointed out that the present four projects of the Mining Development Program are Face Transportation, Metal Conveyor Belts, Dust Control, and Mine Illumination.

With presently available funds, we should by September 1, 1953 obtain some worthwhile results. All of them should contribute in some degree to ultimately achieving a continuous mining system.

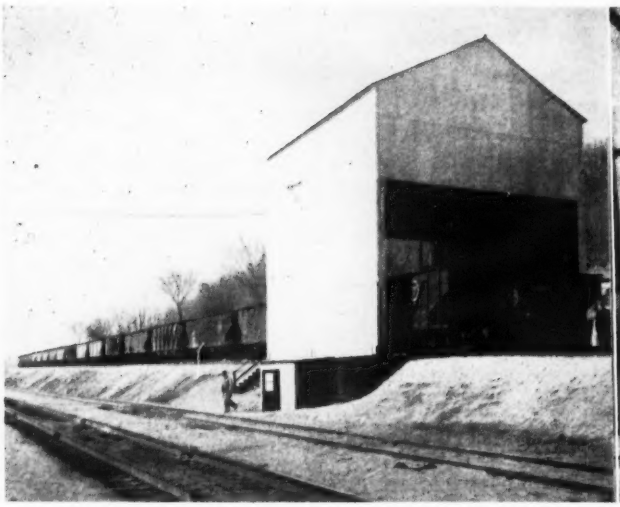
Continuous Face Transportation is the necessary link between the continuous mining machine and main line transportation. Work on this project in the immediate future will be centered around the development of a portable surge car, to help eliminate downtime of the mining machine.

Those of you who subscribe to the Mining Development Program received the Metal Belt Status Report in January, which stated that so far results have been good and very little remains to be done on this project. In Pennsylvania one metal tipple belt has been in continuous daily service for over six months. The program should be completed by September 1, 1953. This has been a cooperative program with the United Electric Coal Companies.

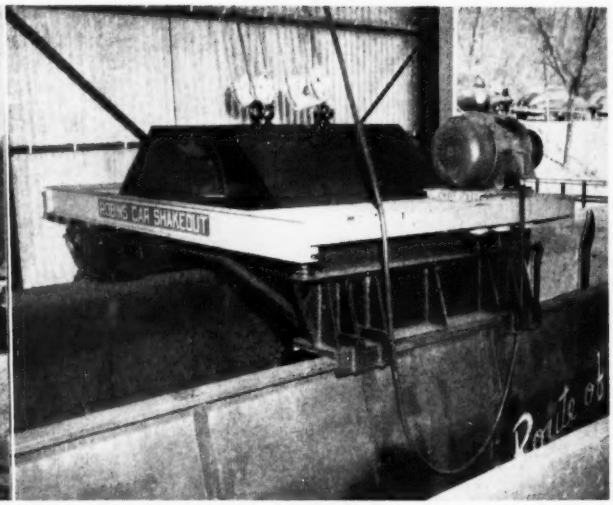
Mine Illumination will first consist of actually installing underground in a working section the same quality and type of illumination used in shops and factories. This lighting will be in all the working places of the section. Records and data will be maintained for a period of six months or more. We are not attempting, during this initial phase, to design or develop any special equipment or fixtures but rather to use presently available commercial equipment. As Mr. Thomas mentioned, this project is set up on a cooperative basis whereby the Mine Safety Appliance Company provides the funds to cover the out of pocket expense of the project.

Dust Control, at present, consists of a review of the literature and an investigation of what has been and is being tried. This project, as yet, does not have a cooperative sponsor as have the other three projects. As can be expected, Dust Control is a very involved subject and related to other phases of mining such as cutting, ventilation, etc. However, we hope that by September 1, 1953, we will have enough data to pretty well outline the extent of the problem. In the event that we obtain a cooperative sponsor which would permit some field work, we could be farther along by September 1.

From a Development Engineer's point of view, these four projects are important to the industry and this work should lead to cost reduction. But compared to what could be achieved, it is rather like trying to do with a shovel and wheelbarrow what should be done with a power shovel. We will eventually get the job done with a shovel and wheelbarrow. We just hope the customer doesn't die of old age first.



Cars loaded with 50 to 70 tons of coal each are placed over the 220-ton hopper in the tipple at Missouri Pacific's new coal transfer at Ford, Ill. Cars to the north of the tipple (those shown in left center) are loaded.



An electrically operated car shaker, placed on top of the car's sides, sets up vibration which speeds the unloading.

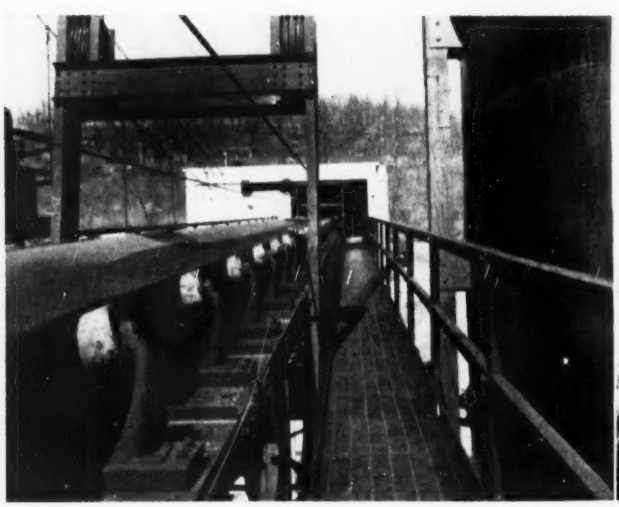
COAL TRANSFER FACILITATES CAR TRANSFER

● Just a few hours after coal is loaded into railroad hopper cars at mine tipples in the Bush, Pinckneyville and Sparta areas of southern Illinois, it is pouring into barges on the Mississippi river at Ford, Ill., at the rate of 1250 tons an hour. Thence it moves, in barge-load quantity, to various destinations up and down the Mississippi and its northern and southern tributaries.

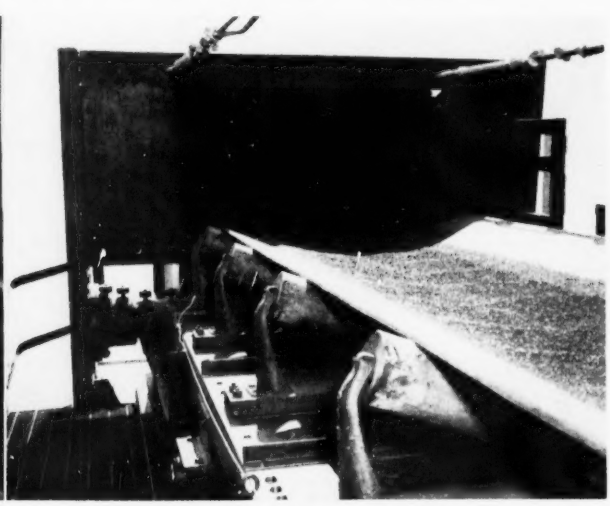
The new facility, known as a coal transfer, was built and is operated by Missouri Pacific Lines to provide a means whereby mine operators in the originating districts are afforded new and improved market outlets for their product.

The transfer is located at Ford, Ill., (also known as Kirk's Landing) on the east bank of the Mississippi some 70 miles south of St. Louis and approximately five miles south of Chester, Ill. It serves mines located on Missouri Pacific tracks in Perry, Franklin, Williamson and Randolph counties of southern Illinois.

One of the reasons for locating the facility in the Chester area was to bring it as close as possible to the mines in order to avoid the long terminal delay encountered in handling coal trains through the



Coal for barges moves from the 220-ton hopper pit on a 60-inch, electrically operated conveyor belt. Picture shows a portion of the belt on the loading boom.



Spilling into the loading chute, coal which just a few minutes earlier was in hopper cars on the railroad tracks is on the verge of dropping into waiting river barge.

St. Louis switching area. Another is that the location makes it possible for Missouri Pacific to control the car supply by handling its own cars from mine to transfer and back to mine. This makes it possible to select the type of car best suited for the work being performed at Ford and, of even greater importance, it reduced the turnaround time consumed in making the trip from mine to transfer and back to mine. This has the effect of materially increasing the number of hopper cars available.

Coal is dumped from self-clearing cars into a track hopper, which has a capacity of 220 tons, and transferred to barges in the river by means of a 60-inch moving belt passing under the railroad's main line tracks and through a headhouse to the loading device suspended between the two main piers. The entire plant is electrically operated, with controls located in the north or up-stream pier.

Each of the two main piers is a steel shell 60 feet tall, 15 feet in diameter and filled with concrete. The piers, as are the 12 mooring dolphins, are secured to bed rock by means of steel pins, or dowels, two inches in diameter and 11 feet in length.

There are 12 dolphins at the present time, six above and six below the main piers. Each has the same dimensions as the main piers but, instead of being entirely filled with concrete, each dolphin is filled with concrete for a distance of 20 feet from the base and then filled to capacity with sand. Each is capped by a top of asphaltic concrete. Mooring rings are at convenient places on each dolphin for securing barges, and for storage purposes, there are barge anchors above and below the facility. These anchors are of concrete, capped and equipped with mooring rings and 500 feet of cable each. Should later demands make it necessary, additional dolphins and anchors will be placed.

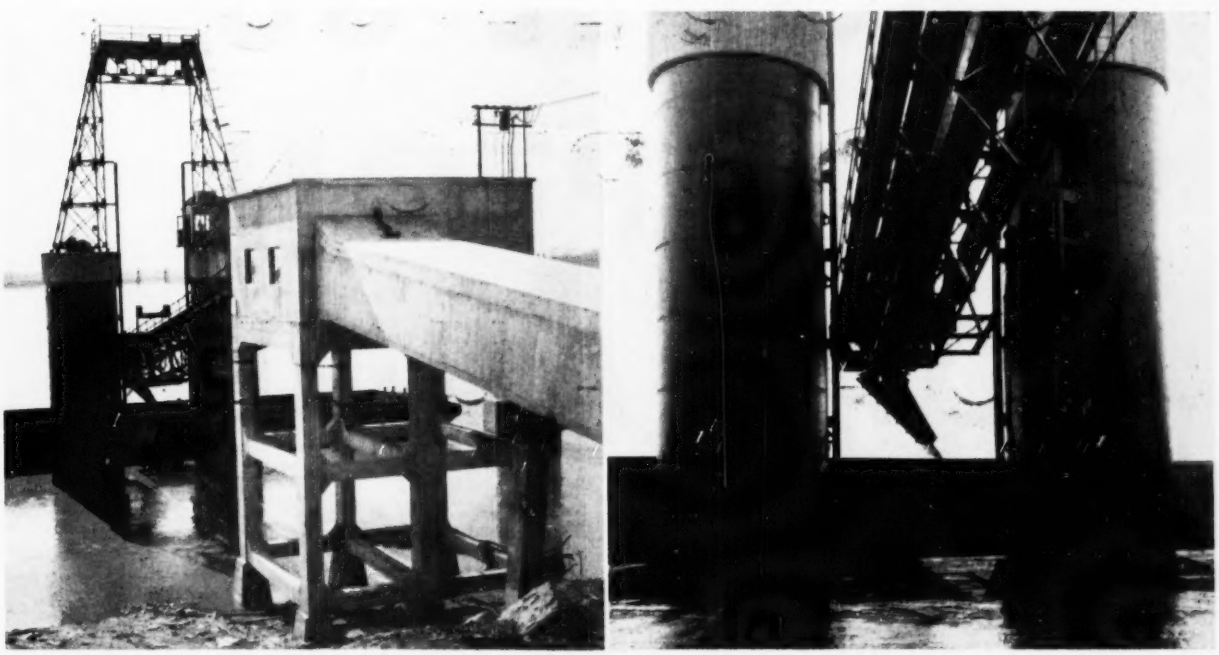
The loading boom, operation of which is controlled from the up-stream pier, has an adjustable revolving chute trimmer designed to handle stoker and domestic grades of coal. In loading barges with coal it is necessary that the coal be distributed evenly in the vessel to avoid listing and the purpose of the trimmer device is to see that the coal is placed in exactly the right position. The trimmer installed at Ford is the only one of its kind on inland waterways. To conform to varying stages of the river, the boom has an up and down operating range of 44 feet and swings from side to side over a radius of 113 feet. Barges are moved into loading position and manipulated while receiving the lading by a harbor boat and pulling lines secured to the dolphins.

On the landward side is the tipple, straddling the hopper and equipped with an electrically-operated car shaker to speed the unloading process. In the initial operation a car of coal was unloaded in two-and-a-half minutes and it is expected that this time will be stepped up to a car each minute.

There are two tracks through the tipple, with each extending north and south a distance sufficient to hold 25 cars on either side. Thus the unloading yard will hold 50 loaded cars, or 25 on each track to the north of the tipple, and the same number of empty cars on the extension of the two tracks to the south. Cars move into and out of the tipple by gravity are controlled as to their speed by hand brakes. At the present time there is but one car shaker mounted in the tipple, but it can be moved to cover either track. If there is sufficient demand, an additional shaker can be easily installed to permit unloading from both tracks simultaneously.

Access to the tipple is by means of a running track which parallels the main line track of Missouri

(Continued on Page 33)



Left: Coal pours out of the loading chute into a barge. Right: Overall view of the Missouri Pacific coal transfer at Ford, Ill. The head house is built of reinforced concrete; the piers are steel cylinders filled with concrete. Operating controls for the entire facility are in the cabin on top of the up-stream pier (shown at right) and loading boom is suspended by heavy cables from the A-frame which rests on the piers.

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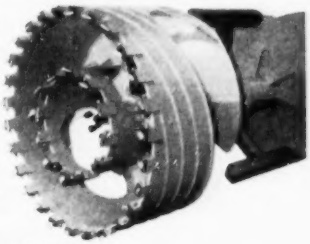
Possible Drilling Depth: 160 *feet*



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FIRE-RETARDING PAINTS AND COMPOUNDS FOR USE ON MINE TIMBERS

By P. F. YOPES
Mining Engineer, U. S. Bureau of Mines, Seattle, Wash.

Many precautions and preventive means are employed to reduce the fire hazard when wood or other combustible materials are used for construction or ground support in mines or in mine-plant surface buildings. A little-known and effective method of making such materials fire-resistant is by spraying or brushing them with a fire-retardant coating or solution. More than 20 companies manufacture fire-retardant compounds, but lack of knowledge of their effectiveness, limitations, and characteristics has restricted their use; acceptance of the good products available has been further hindered by extravagant claims and promotion of products of doubtful value.

My purpose is to present information on fire retardants, which will help determine what they can contribute to a fire-protection program, particularly underground, and what types are most suitable for specific applications.

Only fire-retardant compounds that are effective in relatively thin coats and can be applied by spraying or brushing are considered. Wood or other absorbent material can also be made fire-resistant by impregnating it with chemicals by pressure or soaking methods; these are accepted commercial processes. Such treatment is expensive and cannot be used for existing structures. Guniting also makes wood fire-resistant but is expensive and often impractical and has the serious disadvantage of hiding and accelerating mine-timber decay.

Although the Bureau of Mines investigation of fire retardants has been primarily limited to their use on mine timbers, the information obtained is also of value in considering surface-building applications.

The conclusions presented are based primarily on results of test work conducted on 16 different property fire retardants.

Extraordinary fire-protective means are necessary in mines because of the potential seriousness of a mine fire, and those men connected with underground operations must always be aware of the importance of fire prevention and control. Although mine fires have not been a major cause of underground fatalities in recent years, they occur daily and are a constant threat because of the possibility of killing a large group of men at one time and of causing enormous property damage if unchecked in the early stages.

Mine timbers are the principal fuel in most metal-mine fires, and timber has been an important factor in coal-mine fires. Wooden buildings near mine openings are also a serious hazard to men working underground, as fires starting in them may spread to the mine or smoke and fire gases may be carried underground with ventilating air currents and trap and asphyxiate mine workers. Fire prevention and fire control in the early minutes of a blaze are the only means of guarding against this hazard. Automatic fire-fighting devices are particularly valuable in combating mine fires because of the likelihood of fires occurring in unattended areas and progressing to serious proportions before being discovered. These facts emphasize the value of a means of increasing fire resistance of mine timbers and buildings.

Applications and Functions of Fire Retardants

Fire-retardant solutions and coatings are used principally on combustible materials. When so used, a fire retardant will increase the resistance of a material to ignition, thereby hindering it from adding fuel to an existing fire and thus helping to prevent the spread of the fire. **Wood cannot be made fireproof**; a fire-retardant coating or compound, however, may prevent it from catching fire from a relatively small outside source of ignition and if it should catch fire will slow down its burning rate, affording time to fight the fire by conventional means.

Fire-retardant coatings are also used on combustible materials, particularly in military installations. Their use for this purpose virtually eliminates the hazard which the use of a conventional oil-base paint would introduce. One particular type of fire retardant has also been recommended for use on steel or concrete structural members as a "heat retardant." The coating puffs up into a tough, cellular, heat-insulating mat at relatively low temperatures, protecting support members from the heat of a fire and so reducing spalling of concrete and heat softening of steel.

The actual combustion of most solid materials does not take place until the material has been decomposed and flammable gases have

been generated. Remaining charcoal may glow in the presence of oxygen and spread the fire by heat radiation, but the flame and fire are spread principally by burning gasses. Fire-retardant coatings and solutions act through a number of mechanisms to reduce the formation of flammable gas and hinder the meeting of these gases with the oxygen in the air. There are three general types of fire-retardant mechanisms: Development of a heat, flame, and gas barrier; generation of inert gases; and alteration of the combustion process of the material to which the solution or paint is applied. These take place as follows:

The most-effective type of barrier is a coating that puffs into a spongy insulating mat many times its original thickness when exposed to heat. Some other fire retardants act in a somewhat similar manner, but less effectively, by developing blisters when exposed to fire. Other fire retardants have borax or other easily fusible chemicals, which melt and form a glaze when exposed to heat, confining wood gasses and protecting the underlying material. Chemical solution-type fire retardants promote formation of a protective and insulating skin of soft char. The barrier provided by many fire retardants (by all of them to a certain extent) is simply the crust of incombustible paint pigments and coarse particles that remains after the volatiles in the compound have been baked or burned out. A protective skin produced in this manner is effective if the fire is not intense, but may crack or spall off under severe fire conditions.

Inert gases generated result from decomposition of chemicals in the fire retardants when exposed to heat. They act by diluting flammable wood gases and by smothering combustion.

Chemicals that alter the combustion process of materials cause char to be formed at low temperatures and retard the formation of flammable gases when the material decomposes upon application of heat.

Types of Fire Retardants

Fire retardants can be divided into types on several different bases. The most-satisfactory grouping would be by chemical composition, so a product could then be bought on the same basis as alloy steel, the purchaser knowing from results of laboratory tests and previous experience with similar compounds the performance of the product. However, proprietary-product formulas are not published; for practical purposes, a classification system must be based on identifiable characteristics.

To provide general information on the variety of fire retardants sold and to help in following and using the test results given later in this paper, fire retardants have been grouped into the following five general types: Chemical solutions generally in water, water emulsions of chemical powders, conventional oil-base paints to which insoluble fire-retardant chemicals have been added. Borates and antimony oxide are the more-common additives; oil-base-type paints to which insoluble fire-retardant chemicals have been added, the vehicle of which also contributes to the fire-retarding property; asphalt, or synthetic-base mastics containing large proportions of relatively large, incombustible fibres or grains of such materials as mica, vermiculite, and asbestos.

Fire retardants vary greatly in effectiveness and in such other characteristics as durability and appearance. As the effectiveness of a product cannot be determined by appearance or by everyday use, selection can be based only upon knowledge of actual fire experience or data obtained from laboratory tests.

A number of laboratory fire tests have been devised, but none has been accepted as standard and test results on individual proprietry products by brand names are not generally available. Information on some products can be obtained from various state and city approval lists; the Underwriters' Laboratories Fire Protective List for 1952 gives test results of four products. Many manufacturers have had their products tested by private laboratories, but often the tests are improvised or follow procedures outlined in Federal Specifications SS-118a and do not yield numerical data. The most-extensive evaluation work has been done by the Forest Products Laboratories at Madison, Wisc., which like other government agencies, do not disclose brand names.

Bureau of Mines Test Work

The Accident Prevention and Health Division of the Bureau of Mines undertook an investigation of fire-retardant coatings and compounds in 1949, recognizing their importance as a possible means of mine-fire protection.

Tests were conducted on 16 different products or combinations of products, applied according to the manufacturers' instructions. Each paint or compound was applied by brush to four rough-sawn 2 by 4 by 18-inch Douglas-fir test panels. A fire test was made on one panel 3 weeks after treatment, and the remaining panels were placed at the 6-level station of the Knob Hill mine, Republic, Wash. A test panel of each product was removed after 6, 12, and 18 months' exposure in the mine to determine whether or not the fire-retarding property of the various coatings had changed. Work has been completed on 14 products, and the 18-month test on the other two compounds will be made in December of this year.

The panels were exposed to a controlled alcohol flame while supported in an inclined position, and a test was made on both the treated and untreated side of each panel. Test data collected included char measurements, duration of flaming and glowing after the alcohol flame had ceased, observations of flaming and

smoking while the test was under way, and estimates of the reduction in the degree of burning on the treated side as compared with the untreated side.

In summarizing the results of the test work, the estimated reduction in degree of burning by treatment is referred to as the percent effectiveness. This is an approximate quantity, based on char measurements, and allows comparisons to be made between the various paints and compounds tested. However, the percentage figure refers only to this test, and **a product that was 100 per cent effective in a test of this severity would not render wood incombustible** and would not necessarily be 100 per cent effective against a more severe fire exposure.

Summary of Test Results

Two water-solution-type fire retardants were tested; one was a fire-extinguisher agent that has been recommended for use as a fire-retardant compound. Two applications of each solution were made to each test panel, allowing 24 hours' drying time between applications. No overcoat was used. The performance of these two products was as follows: The fire-extinguisher agent was about 50 percent effective when freshly applied but decreased in effectiveness to 35 per cent after six months and to 25 per cent after one year. The other solution-type retardant was 15 to 25 per cent effective in tests and appeared to become slightly less effective after exposure in the mine.

To prevent leaching out of water-solution-type fire retardants, the manufacturers recommend that they be overcoated with an oil base Type 4 fire retardant. Two products treated in this manner were tested, and it was found that an appreciable increase in fire-retarding strength was obtained. A Type 4 paint alone showed 25 per cent effectiveness as against 40 per cent when the same paint was applied over a Type 1 solution. The combination treatment did not lose its effectiveness after exposure for 18 months in the mine.

The other panel treated with a combination coating was 35 per cent effective and was not affected by exposure in the mine.

Four products of the water-emulsion type were tested with the following results: Two synthetic-resin-phosphate fire retardants showed the greatest effectiveness of all the products of 11 types tested. These are the coatings that puff into a spongy mat when exposed to heat. On some of the test panels these products were virtually 100 per cent effective. They showed no loss of fire-retarding property after 18 month's exposure in the mine and apparently did not undergo a chemical change under mine-air conditions.

A third water-emulsion-type retardant was 80 per cent effective when tested but after exposure in the mine for 6 months was only 40 per cent; after 12 months it had almost lost its effectiveness. This product contains sodium silicate as one of its fire-retarding ingredients, and its loss in effectiveness was, no doubt, due to chemical changes that occurred in contact with air. These changes may be accelerated by mine conditions.

The other water-emulsion product tested had an asphaltic base and had so little fire-retarding strength that it cannot be considered fire-retardant.

Tests on Type 3 Oil-Base Paint Fire Retardants

Two oil-base paints containing insoluable fire-retardant ingredients were tested; the fire-retardant ingredient in one was finely ground portland cement. They showed about 25 to 30 per cent effectiveness and did not lose effectiveness under mine conditions. The portland cement-base paint was slightly more effective than the other, which appeared to contain borax as a retardant.

Tests on Type 4 Oil-Base Paints with a Fire Retardant Vehicle and Chemicals

Four Type 4 oil base paints were tested. Their performance showed the following wide variations in fire-retarding characteristics: One paint was much better than any of the others, showing 80 per cent effectiveness shortly after application and after six months' exposure in the mine. After 12 months' exposure in the mine, the test results indicated that effectiveness had decreased to 50 per cent. This coating has swelling characteristics similar to the synthetic-resin, phosphate-type paints.

Another paint was 60 per cent effective when first tested but decreased in effectiveness to about 30 per cent after 1 year. This product developed small protective blisters when exposed to the test flame, but this characteristic was lost after the paint had been exposed in the mine.

The other two paints were only 15 and 20 per cent effective when tested shortly after application but improved with the passage of time. after being exposed in the mine, one had increased its effectivness to 40 per cent, and it retained this fire-retarding strength after 18 months. The other paint was about 25 per cent effective in tests made after 6, 12, and 24 months' weathering in the mine.

Tests on Type 5 Paints—Mastic Base

Two mastic-base paints were tested, one with a synthetic and the other with an asphaltic compound for a base. The asphaltic compound was 55 per cent effective and the other 40 per cent effective. Their effectiveness did not alter over the 18-month test period. However, both paints produced a large amount of smoke when tested and did not restrict flaming until the volatiles had baked out, leaving an incombustible protective skin on the wood. Under test conditions this skin appeared quite durable, but it is not known how well it would withstand actual fire conditions.

Comparison of Test Results

The comparative performance of the 16 fire-retardant products can be summarized as follows:

Two water-emlusion, synthetic-resin-phosphate coatings were much more effective fire retardants than the other products tested, and did not lose their effectiveness after exposure in the mine.

One type 4 oilbase paint showed almost as much fire-retarding strength as the two synthetic-resin-phosphate coatings when freshly applied and exhibited the same characteristics of swelling into a mat when exposed to heat. However, its effectivness diminished to 50 per cent after 12 months' exposure in the mine.

Two mastic-base-type fire retardants were about 50 per cent effective and retained their fire-retarding strength under mine exposure. However, they appeared

to give off flammable volatiles when exposed to the test flame and produced heavy smoke. Their fire-retarding property consisted largely in the protection offered by the residual incombustible crust left after the paint volatiles had baked and burned out.

Nine fire retardants of the oil-base and water-solution types showed 25 to 40 per cent effectiveness. Some retained or increased their fire-resistant capacity after aging in the mine, while others lost some of their original effectiveness. The solution-type retardants required an overcoating to prevent loss of fire retardancy.

Two water-emulsion-type coatings proved of no practical value for mine use. One asphalt-water emulsion had very little fire-retarding strength, and the other coating, which contained sodium silicate, lost most of its effectiveness after 1 year of mine exposure.

Characteristics of Fire-Retardant Compounds

A number of qualifications in compound for a particular job. enter into the choice of a paint or addition to fire-retarding capacity Some of the principal factors to be considered are: **Durability**—A coating must be able to withstand the service required. Mastic coatings are the most durable and are resistant to both chemical and mechical attack. Fire-retardant chemicals may leach out of water-base and some of the oil-base compounds if surfaces treated with them are washed or exposed to dissolving action from some other cause. The most-effective oil-base-type paints are generally the least resistant to leaching. Water-emulsion-type coatings do not adhere to hard surfaces and are removed by vigorous washing.

Finish—Appearance may be an important factor in the selection of a fire retardant for use in surface buildings where variously colored, glossy, washable paints are often required. Although of less importance underground, a light-colored reflective finish is a desirable feature. Water-solution-type compounds darken timbers slightly, while most coatings give a light-colored finish. The asphalt-base mastic is black but can be made light reflective and more attractive by the addition of aluminum pigment. The use of aluminum will increase the cost but probably also will increase the fire-retarding capacity.

It is doubtful if spray- or brush-applied fire retardant compounds directly affect the strength of timbers, but heavy mastic coatings may accelerate decay. Some compounds, particularly the water-solution chemicals, corrode metal fittings. If this is an undesirable feature, a noncorrosive compound or one containing anticorrsion chemicals should be specified when buying.

None of the fire retardants is known to generate dangerous amounts of toxic gases during a fire or to be toxic to the skin. One synthetic-resin-phosphate paint has been reported to give off irritating fumes when curing, and in one mine hoist-room application the fumes persisted for 6 weks after painting. This is an objectionable feature in confined or poorly ventilated places and for such applications as underground or surface change houses, lunchrooms, and offices. When a paint with this characteristic is used, the painting should be done off shift and on weekends if possible.

Safeguards against fire, explosions and gas poisoning must be taken when flammable and sometimes toxic thinners are employed in oil and mastic-base-type paints. Water-base compounds and coatings may contain chemicals sufficiently toxic to require the use of respiratory protection when spraying is done.

All paints and compounds known can be applied by spraying or brushing. Water-solution compounds are probably the easiest to apply and require the least amount of cleaning of the surface beforehand. Two coats are recommended for all products, and a longer drying time between coats must be allowed for water-base products than for oil-base paints, especially under humid mine conditions.

Tests have shown that some proprietary compounds lose effectiveness after several months' exposure to mine conditions, and a means of knowing the effectiveness at all times is an important requirement. The mastic-base paints, some of the oil-base paints, and the synthetic-resin-phosphate coatings do not seem to lose fire-retarding capacity; they can be checked by a simple visual examination of the coating's thickness and cover. Other coatings cannot be checked by visual examination and must be maintained by repeat applications at regular intervals, or provision must be made for actual tests of their effectiveness from time to time.

The cost of an applied fire-retardant compound must compare with that of other available means of fire protection, and be considered with respect to the degree of fire hazard. In mine uses the entire cost should be charged directly to fire protection, whereas in surface buildings, which would normally be only the increased cost due to the use of a special-purpose paint need painted with conventional paints, be charged to fire protection. Costs will range from about 2 cents per square foot for some water-solution compounds to from 5 to 20 cents per square foot for the other prothickness of coating applied. Since ducts, depending largely on the the fire resistance imparted is proportional to the quantity of fire-retardant chemicals deposited in the wood fibers or applied as a coating, more-expensive applications will also afford greater fire protection.

Use of Fire-Retardant Compounds in a Mine-Fire Protection Program

Timbered underground hoist rooms, shaft stations, lunchrooms, offices, powder magazines, workshops, and rooms enclosing mechanical and electrical installations are the most obvious places warranting use of fire retardants, as they are the points of greatest fire hazard. Some circumstances may justify their use in parts of shafts, haulageways, or airways, but cost and difficulties of application and maintenance may prevent their general application to shaft and level timbers.

Whenever possible, concrete, rock bolts, or other incombustible materials should be used in place of timbers in main mine openings, and excessive use of timber should be avoided in stations.

Recomendations

The water-emulsion, synthetic-resin-phosphate-type coatings are recommended for most mine underground and surface applications. Of the products tested, these are the most-effective fire retardants; they do not appear to be affected by mine conditions, and the fire

protection they afford can be checked by observing the thickness of the coating.

These coatings are not washable and do not provide a durable finish. However, tests and actual use have shown that they are serviceable enough for ordinary mine use. They should not be used on floors, furniture, or surfaces exposed to heavy wear. A trial area in a mine station painted with a coating of this type withstood service for two years without showing signs of wear, except where particles had been chipped off when drill steel or machines were set against it. A similar product made by another manufacturer was used in an underground hoist room and showed no checking, scaling, or deterioration two years after application.

The irritating fumes produced by one product of this type is a disadvantage in areas that are poorly ventilated. Products that do not produce such fumes can be obtained.

Water-solution-type fire-retardant compounds are used because of low cost and ease of application, and it has been reported that the fire-extinguisher agent referred to in the Bureau of Mines test results is used at one mine, the timbers being treated every six months to maintain fire resistance. The most-serious disadvantage of this type of fire retardant is the difficulty of dtermining the effectiveness of fire protection provided. Protection depends upon the quantity of chemical deposited in the wood fibers, and upon its resistance to chemical reaction with constituents in the mine air or timbers. Application should be carefully supervised and the fire-resistant checked, or another application of solution should be made at regular intervals.

Some water-solution-type fire-retardant compounds can be painted with coating-type compounds. This is recommended if the fire hazard warrants the increased cost. The fire-extinguisher compound cannot be painted.

Oil-base-type fire-retardant coatings are not generally suitable for use on mine timbers because of cost, poor effectiveness, and possible loss of effectiveness in the months following application. For applications where wearing quality and appearance are important factors, the most-effective oil-base product reported in the test results may be suitable. This coating should be applied in as thick a coating as practicable and economical to obtain the maximum fire protection possible.

There are many applications for oil-base-type fire retardants in place of conventional paints in the mine and on the surface for machinery, cabinets, building, furniture, and similar uses.

The mastic-base fire-retardant compounds provide a tough, long-wearing, chemically resistant coating and can be used on timbers exposed to heavy wear. Their principal application, however, appears to be for cabinets, mine rescue and first-aid equipment boxes, and other wood and metal surfaces; these compounds provide protection against corrosion and deterioration as well as fire protection. The mastic compounds are probably the best type for use on wooden mine-ventilation and fire doors.

The fire-retardant chemical coatings and solutions now commercially available are a valuable means of providing fire protection at mines. Individual products must be selected with care.

Experience in actual use of such fire retardants will help materially in determining their value, and research, no doubt, will develop better products for future use.

● Election of C. P. Rooney as treasurer of Mine Safety Appliances Company, Pitsburgh, world's largest manufacturer of safety equipment, was announced today by J. T. Ryan, Jr., president.

Associated with the company since 1927, Mr. Rooney is a graduate of Duquesne University with a B.S. degree in Economics. He received his Certified Public Accountant degree in Pennsylvania in 1932.

Mr. Rooney was elected assistant secretary of the company in 1940 and assistant treasurer in 1948. He also is a director of Callery Chemical Company, an MSA subsidiary, and of Mine Safety Appliances Company of Canada, Ltd.

He is a member of the Pennsylvania Institute of Certified Public Accountants, American Institute of Accountants and the National Association of Cost Accountants.

● Friday, March 13 was an anniversary date of a sort when the 25,000th gear box came off the assembly line at the Peoria, Illinois plant of R. G. LeTourneau, Inc., construction equipment manufacturer. The mechanism through which proper gear ratios are obtained for scraper and tractor operations, the gear box is pictured here attached to an electric motor of the type which actuates LeTourneau earthmovers. Viewing the motor and gear box combination (left to right) are Merle R. Yontz, Peoria plant manager; Gaylon Welch, gear box assembly foreman; John Mattern, test operator and Hal Geurin, Superintendent Plant 2.

● The 1953 Annual Meeting of the Pocahontas Operators Association was held at the Hotel New Yorker, March 27. All incumbent oficers were reelected—William Beury, President; H. R. Hawthorne, Vice President; Henry Warden, Treasurer, and B. B. Housman, Secretary. The Executive Committee elected is composed of Mesrs. William Beury, Samuel A. Crozer, J. J. Foster, H. R. Hawthorne, Roland C. Luther, A. R. Matthews, W. W. Walker and Henry Warden. Mr. Crozer filled the vacancy created by the resignation of James A. McQuail, who had been a valued member of the committee for many years. Mr. McQuail recently retired from the coal business.

● A new c.f.m. compressor of high speed 2-wheel trailer design is announced by Davey Compressor Co., Kent, Ohio.

Known as Super Chief Model 210-WDS, the new unit is said to be the lightest, most compact compressor ever built of this capacity. It is 145 inches long, 62 inches high and 75 inches wide. Weight is 3400 lbs.

The compressor unit is of W series design and is equipped with newly-developed Davey Multi-Port Valves. Use of these valves is said to increase by 15 to 25 percent the amount of air delivered per lb. of fuel. In addition, valves are reputed to never carbon or foul and to operate at peak efficiency during the life of the compressor. Engine is of Hercules 6 cylinder design with a power surplus of over 25 percent.

NEW AUSTIN-WESTERN PORTABLE COAL CRUSHING AND SCREENING PLANT

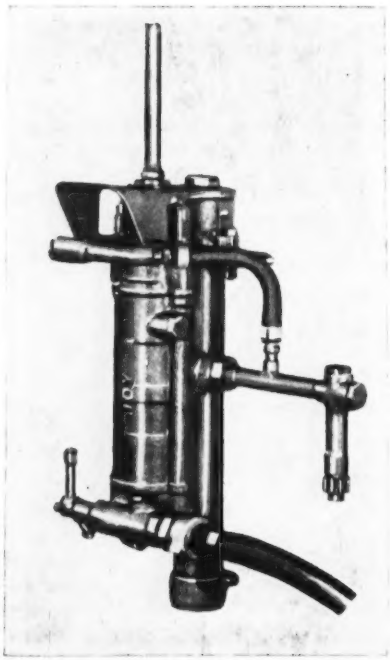
consisting of

- GRIZZLY LOADING SCREEN
- SIX FOOT SQUARE HOPPER
- TWO FOOT BY EIGHT FOOT COMBINATION SCREEN AND PICKING TABLE
- DOUBLE ROLL COAL CRUSHER
  Standard Rolls reduce 10" lump to Minus 2"
  Capacity 75 to 100 tons per hour
  Special Rolls available for reducing to Minus $\frac{3}{4}$.
- MECHANICAL PLATE FEEDER
- TWENTY-FOUR INCHES WIDE BY SIX FEET LONG DELIVERY CONVEYOR
- GAS OR DIESEL POWER — 40 HP
- PLANT HIGHLY PORTABLE AND CAN BE EITHER TOWED, USING FRONT DOLLY, OR KING PIN TOWED WITH FIFTH WHEEL TRACTOR

JOHN W. PATTERSON COMPANY

ROOK STATION PHONE CARNEGIE 3500 CARNEGIE, PA.

Hard Limestone and Sandrock highwall at the Toronto Coal Company, Toronto, Ohio.

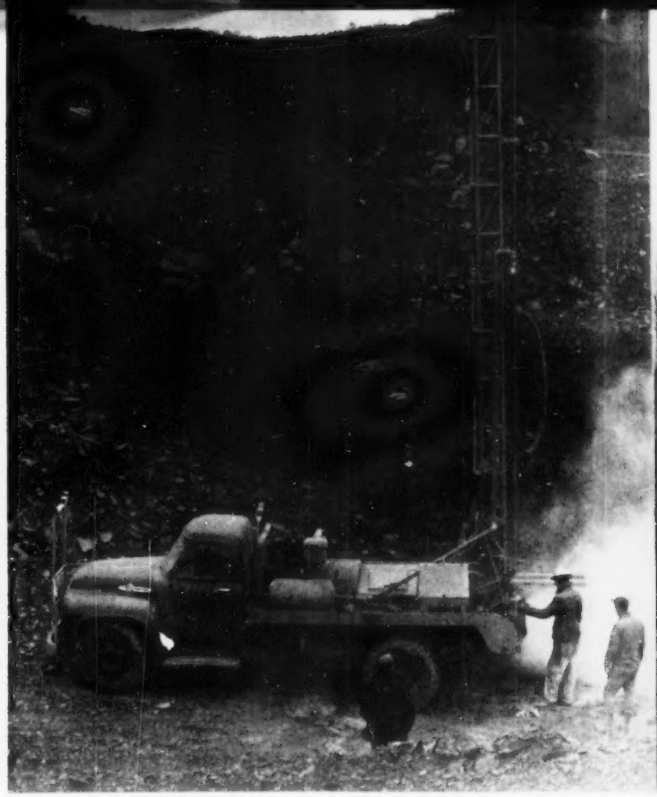


Joy Air Type Roof Bolting Drill

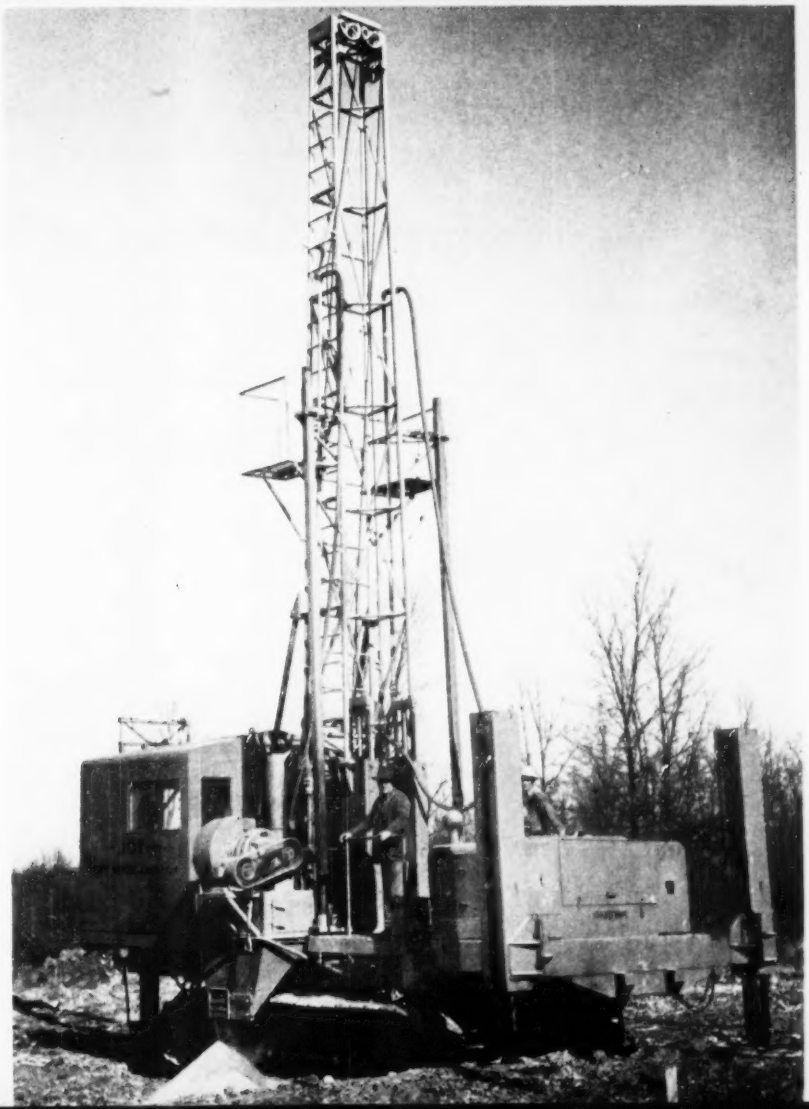
ROTARY AIR DRILLING FOR STRIP MINING

Among the several important things that must be done to permit more economical coal stripping is better and faster blast hole drilling in overburden. New type stripping equipment cannot be any better than the preparation of the material to be moved. Dry, rotary type drilling offers a considerable improvement in the preparation of overburden on coal.

To this time many coal strip mine operators have stripped only the overburden that could be moved without shooting, then abandoned their operations. Recently many of those abandoned pits have been reopened, using bigger and later type equipment. Many more of those abandoned pits will be reopened just as soon as the word gets around that very efficient, portable, rotary type air drills can be had at a very reasonable cost. Several different makes are now on the market, ranging from tractor tread mounted units to smaller, extremely portable truck mounted units with power take-off from truck engine for driving both the air compressor, the drill and the rotary table pulldown mechanism for applying pressure to the drill bit.



(Top)
The New Mayhew "Hurricane" Rotary Air Drill for blast hole Drilling in Overburden. It is Truck Mounted which makes it extremely portable on Benches and on Highways. Will drill any rock encountered in coal stripping. Has dug one foot per minute in hard limestone at the Toronto Coal Company. In shale and sandstone at the Weirton Construction Company, Weirton, W. Va., it dug 35 foot holes, $6\frac{1}{2}$ in. diameter in 11 minutes, including moving. Smaller holes can be drilled at faster rate. Drill and 315 CFM piston type air compressor are powered from take-off on truck. No additional power is required. Cuttings removed with air, using Hughes Tri-Cone Roller Type Rock Bit used in Oil Fields.



(Right)
Joy Champion Dry Blast Hole Drill for Coal Stripping has tram speed up to 5 miles per hour on crawler treads. Uses Tri-Cone Roller Type Bit that pressure cuts while air removes cuttings. Has 3-point hydraulic leveling. Drills $5\frac{5}{8}$ to $7\frac{3}{8}$ in. diameter holes. Made in heavy or medium weight for electric or Diesel drive.

Overall view of old workings last February

Reopened Abandoned Strip Pit

● This past winter we have seen an unusually large number of reopened coal strip mines that have been abandoned to all intents and purposes by the previous operators and left to the ravages of nature.

In some of these reopened mines new, more efficient stripping equipment has permitted the reopenings while in other cases larger machinery is being employed.

The Blanc Coal Company of Pittsburgh has reopened an abandoned pit in the Pittsburgh seam of coal near Moon Run, Pennsylvania along U. S. Highways 22-30, about 25 miles West of Pittsburgh.

The Pittsburgh seam there averages about 54 inches in thickness but at this pit it runs as high as 72 inches, including what is called top coal. This top coal appears to be the regular Rooster coal with the conventional draw slate missing. The top coal is of high quality and mixed with the regular seam coal is accepted for steam generation by a large public utility which has special burning equipment for that kind of coal.

Overburden on the coal is a dark brown shale at the outcrop but which turns to a blue and hard shale as it gets deeper. Stripping is being done with a new Osgood Model 1006 shovel which moves up to 45 feet of overburden without shooting. A Lima Model 802 shovel and a Caterpillar D-8 tractor do cleaning up in the old pits, make and maintain roads and do other necessary chores. The coal is loaded by a small General shovel.

The new Osgood 1006 Shovel being used for stripping.

Among those seated at the speakers table are, left to right, Herman Moore, Mr. Dague, Mr. Reese, B. M. DuBois, Judge Bell, and Matt Cvetic, former FBI Undercover Agent.

Left to right: Matt Cvetic,, Former FBI Undercover Agent, State Mines Secretary W. J. Clements; J. H. Wallin, President of the Association, G. Albert Stewart, Executive Secretary; Deputy Secretary of Mines, W. Garfield Thomas; Harry Gandy, Jr., National Coal Association, Washington, D. C.; Ray Walker, Bradford Coal, Deputy Secretary of Forests and Waters Ralph Wible and Burgess Bratton of Clearfield, Pa.

Central Pennsylvania Open Pit Mining Association Meets

The Annual Membership and Dinner Meeting of the Central Pennsylvania Open Pit Mining Association was held at the Dimeling Hotel, Clearfield, Penna., March 14.

Directors present were Robert Bailey, Lewis Stein, Alex Bailey, Ralph Kuhns, Earl M. Brown, Joe Radomsky, O. T. Shingledecker, Joseph Waroquier, President J. H. Wallin, Vice President B. M. DuBois, Secretary R. S. Walker, and Treasurer Herman S. Moore.

The officers and directors reelected were J. H. Wallin, Philipsburg, president; R. S. Walker, Bigler, Secretary; Herman Moore, Philipsburg, treasurer; G. Albert Stewart, Clearfield, executive secretary, and Robert Bailey, Morrisdale; Everett Moore, Punxsutawney; Lewis Stein, Alex Bailey, Ralph Kuhns and O. T. Shingledecker, all of Philipsburg; Earl M. Brown and Joeph Waroquier, Clearfield, and Joe Radomsky, Osceola Mills, directors. New directors named were Clair Hall, Snow Shoe, and Thomas Minns, DuBois.

Executive Secretary Stewart reported the financial strength of the association at the highest of the association history. By action of the Board the treasurer was authorized and directed to purchase United States Bonds with the accumulated surplus. The membership is in good condition except for the fact that some thirteen of the operator members are out of production. A review of the freight rate cases was heard whereupon it was voted to withdraw temporarily from the ICC case because conditions and developments did not warrant financial outlay at this time. The Board, however, voted to continue to prosecute the freight rate case before the PUC. Officials of the Independent Producers Association of Butler County were present to discuss with your association matters of mutual interest and concern. A continuing report on the several county court injunctions was also heard, all the injunctions thus far granted remaining in full force and effect.

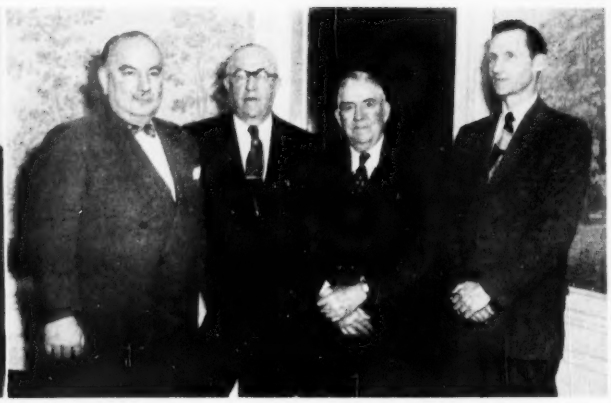
Left: Thomas J. Minns, Minns Coal Co., and C. L. Hall, H & R Coal Co.

At 5 o'clock the annual "A" Membership meeting convened at which meeting Messrs. Clair Hall of Snow Shoe and Thomas Minns, Jr., of DuBois were elected to the Board of Directors succeeding Frank W. Wood of Barnesboro and John J. Earnest of Osceola Mills. Secretary Stewart reported on finances, membership, the rate cases, the oil import campaign and legislation Mr. Stewart reported that no real predictions could be made at this time although the outlook was that the going would be rough.

More than 75 members and guests of the association enjoyed the roast beef dinner served in the Dimeling ballroom. Special guests included W. J. Clements, new Secretary of Mines; Deputy Mines Secretary Garfield Thomas; Deputy Secretary Ralph Wible of the Department of Forests and Waters; Harry E. Gandy, Jr., representative of the National Coal Association of Washington, D. C.; and state mine inspectors of the area.

In a brief talk, President Wallin asserted that the open pit mining industry "is still going just as

Ray Walker, Bradford Coal Company, Pennsylvania Open Pit Mining Association, is shown here, at left, with Harry Gandy, Jr., of the National Coal Association of Washington, D. C.; J. H. Wallin, Philipsburg, President of the Association; Herman Moore, Philipsburg, Association Treasurer; Vice President B. M. DuBois, Clearfield; and G. Albert Stewart, Executive Secretary of the Assocation.



Left to right: Harry Gandy, Jr., Executive Representative of the National Coal Association, Washington, D. C.; William J. Clements, Secretary, Pennsylvania Department of Mines; W. Garfield Thomas, Deputy Secretary of Mines; and Ralph Wible, Deputy Secretary of Forests and Waters.

strong as any segment of the coal industry," and he noted that 18,000,000 tons or 20½ percent of Pennsylvania's 1952 coal production came from strip mines.

Mr. Gandy discussed the fight against importation of residual oil, 98 percent of which comes from Venezuela, he said. He emphasized that residual oil has no connection with household fuel oil but that it is displacing 31 million tons of coal for industrial use annually.

"This importation of residual oil hurts the coal and domestic oil industries, but its greatest threat is to our national security," Mr. Gandy declared. He pointed out that in time of war, submarines would cut off this oil supply and force the nation to fall back on coal and railroad industries, which might not be strong enough as a result of the oil competition, to meet the demand.

Secretary Clements, in acknowledging his introduction, declared his big goal as State Mines Secretary was "to make the mines of Pennsylvania safer for the workers."

Mr. Cvetic, former FBI Agent, told his audience that the death of Stalin "means only a change in cast" as far as Soviet Russia and Communism is concerned. "The communist conspiracy will continue as before," he predicted.

"The fight against communism belongs to all Americans, not just the FBI and the police," Mr. Cvetic declared in warning that the greatest danger from Soviet Russia and communism is infiltration within our country. "This is a fight that if we lose it, there is no going back, and we can lose from the inside," he added.

The address by the one-time FBI agent who spent nine years in the communist party on instructions from the FBI climaxed the association's annual directors and membership meeting. At the directors' and membership meeting held prior to the dinner, all officers and directors were reelected and two new directors were named.

Left: Jim Pugh, Anderson Equipment Co.; Robert Bailey, Robert Bailey Coal Co.; Dick Fink, C. V. Fink & Son; Dewey Penoyer, Penoyer Coal Co.; Bernie Besselman, Dist. Rep. Broadrick & Bascom Rope Co.; J. A. Butler, Capitol Equipment Co.

John DeRomo of Philipsburg, left, looks on as Matt Cvetic, former FBI Undercover Agent in the Communist Party, receives congratulations and hand shake of Walter W. Coldren, Clearfield Branch Manager of Beckwith Machinery Company. Charles Biesecker, new District Representative of Caterpillar Tractor Company, looks on in background.

COAL TRANSFER FACILITATES CAR MOVEMENT

(Continued from Page 19)

Pacific's Illinois division and by a lead track to the north of the two tracks leading into the tipple. Loaded cars are placed on these tipple tracks from the north end of the facility and empties are removed from the south. Coal trains from the Franklin and Williamson county mines move from south to north on the Illinois division while trains from the Pinckneyville area and the Sparta sector (mines in the Sparta region which will ship coal to the Ford transfer are located on the Missouri-Illinois RR., a Missouri Pacific subsidiary) move from north to south.

Space sufficient to provide a four-track yard adjacent to the main line and north of the coal transfer has been set aside, with construction of the yard to be carried out when it is needed.

The transfer can operate from a low water stage of -1.5 on the river gauge at Ford to a high water stage of +34.5 feet, which means that for all practical purposes the facility can be used at virtually ever navigationable stage of the river. The site of the transfer just south of Chester also is in the area of year-round navigation on the Mississippi.

● R. G. LeTourneau, Inc., Peoria, Illinois, manufacturer of heavy construction, hauling and lifting equipment has announced the promotion of J. A. Vincent to the position of Eastern Area Sales Manager and H. R. Gilmore to succeed him as District Sales Representative for Southeastern U. S., ac-

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- ☐ Do the gears you use have surface-hardened teeth?
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All PITTSBURGH gears are made to extremely close tolerances to fit perfectly right from the start. They are guaranteed to give you five times the life of untreated gears, one to one and one-half the life of oil-treated gears, and equal or longer life than any other gear in identical service.

You can readily identify **Armored Gears** by their distinctive corrosion preventive coating—"**Pittsburgh Purple**."

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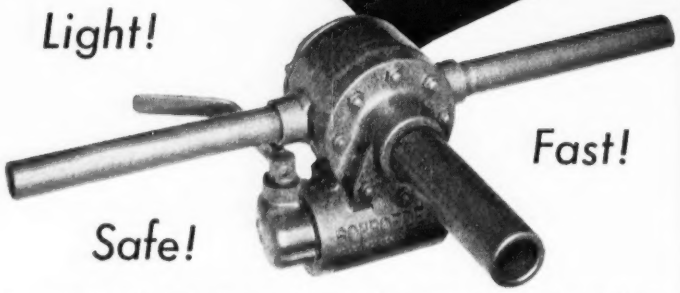

Powered from the hydraulic power system of standard mining equipment, the Schroeder 12-B Coal Drill provides plenty of power for fast drilling with complete operational safety—never any spark, kick, or shock—all electrical hazards are removed yards from the drill! Lightweight and dependable, its design simplicity and minimum of parts result in greatly reduced maintenance costs.
Write or call for details and demonstration.

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for Gathering Service
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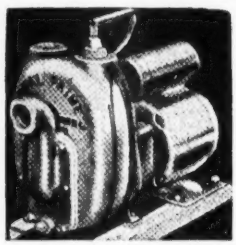

Cap. 3,000 to 200,000
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Engine or Motor Drive

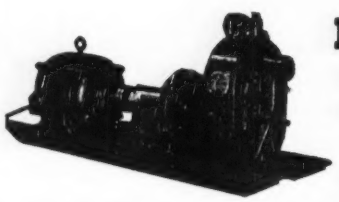
cording to information from Harry R. Powers LeTourneau's Domestic Sales Manager.

Vincent, an associate member of the American Society of Civil Engineers and a member of the Georgia section of this society, accepts his new position with a background of 16 years in the heavy construction equipment field. Graduating from the Missouri School of Mines and Metallurgy in 1937 with a Civil Engineering Degree he worked in the Illinois St. Clair County Highway Department as a highway engineer. He entered the Army as a 2nd Lt., in 1941 and served 2 years with the Corps of Engineers in the St. Louis and Chicago Districts. In 1943 he was assigned to the Aviation Engineers and served with them in the Pacific Campaign on the islands of Saipan, Guam, and Okinawa in the construction of B-29 Airdromes. He was appointed Battalion Commander and received the rank of Lt. Colonel in the field during the battle for Okinawa. Here he was decorated for his battalion's work on airdrome construction.

Replacing Vincent as a District Sales Representative in the Southeastern United States is Howard R. Gilmore.

Gilmore has been in the heavy construction field for the past 21 years working with county highway divisions and as a heavy construction equipment dealer. During the past 9 years he has served the LeTourneau Company on numerous assignments in both the Domestic and Export fields.

Gilmore's headquarter city will be Atlanta, Georgia.



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The Only Satisfactory Check on the Market Today
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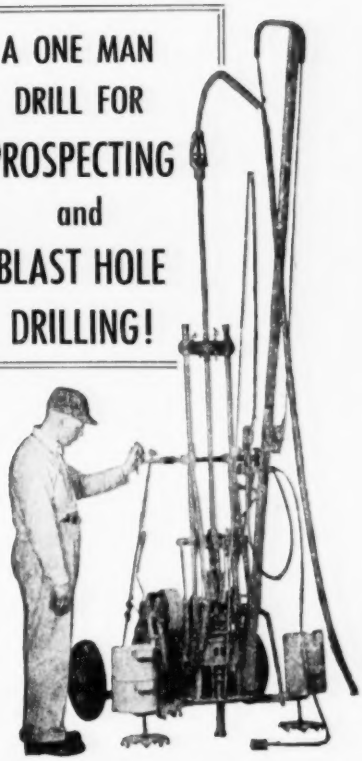
R. E. Snoberger, chairman of National Coal Association's Natural Resources Committee, and president, Truax-Traer Coal Company, presiding at the Foreign Oil Policy Conference, Hotel Statler, Washington, D. C., March 4, 1953. About 150 management and labor representatives of bituminous coal, anthracite, domestic oil, small business, and the railroads held an all-day discussion of the foreign resudial fuel oil problem and worked out a legislative policy, including the establishment of regional committees and a permanent organization to combat foreign oil competition.

Caterpillar Tractor Co. announces production of a No. 6 track-type shovel of two-yard capacity, the firm's first integrally-constructed crawler tractor shovel. The tractor shovel frame is bolted and welded at widely separated points on the tractor engine support channels and the transmission housing. Described by the manufacturer as highly mobile, the No. 6 shovel is powered by a 66-drawbar-horsepower crawler on a non-oscillating track frame.

Aiding this is rear mounting of the hydraulic system which also permits better radiator cooling and, along with the high seat position, better visibility, the maker states. A heavy section cross brace between the lift arms maintains bucket stability. The lift cylinders are horizontally mounted above the tracks to avoid the possibility of clogging with dirt and side door panels prevent dirt from getting into the engine. There is also a heavy duty bumper guard in addition to the customary radiator guard.

Dumping height is 10′ 9″ with a reach of 3′ 5″. Clearance action is assured by a bell crank striking the stop on the lift arm to shake out sticky materials. Control levers for the bucket and the lift arms are located so both may be operated with one hand, and the hydraulic lift arm control lever, once engaged remains in position without holding.

A ONE MAN DRILL FOR PROSPECTING and BLAST HOLE DRILLING!



THIS HOSSFELD ROCK DRILL

with prospecting attachment will cut your drilling costs to as low as 30c per foot . . . give you accurate samplings to 70 feet deep.

It's a compact unit that can be moved into hard-to-get-at places.

- POWERFUL DIRECT DRIVE
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BLAST HOLE DRILLING can be done faster and better, too. Holes are full diameter all the way. Drills at any angle from vertical to horizontal.

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SALEM "HERCULES" AUGERS FOR ELECTRIC DRILLS
Made To Withstand High Drilling Speed, Whip And Torsional Strain Of Electric Drills

Drills holes faster — Will not snap off shank or chip points — Outlasts four or five ordinary augers.
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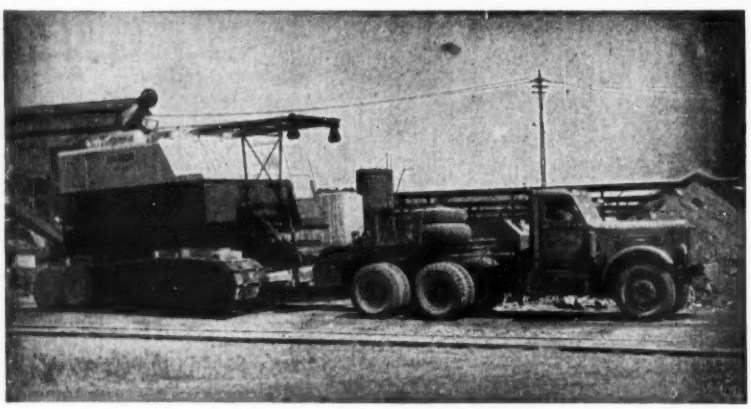
MOVERS of Coal Stripping
and Contractor's Equipment



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● The exhibit of the Detroit Diesel Engine Division of General Motors at the American Mining Congress Coal Show to be held in Cleveland May 11 to 14 will include three Diesel engines of the "71" Series and one 6-110 model. All units will be equipped with General Motors torque converters. A motorized cutaway model showing the operation of the Series 71 two-cycle Diesel engine will also be on display.

In the "71" Series three-and six-cylinder models widely used in loaders, power shovels, yard locomotives and heavy hauling equipment will be shown . The 6-110 model is the Division's highest horsepower single engine unit.

The display will be assembled in booths 1628 and 1634 where factory and field personnel will be in attendance at all times.

● A 28-page booklet in color, describing and picturing the LeTourneau Tournatractor, a high-speed, electric control, rubber-tired tractor available with 10 interchangeable attachments, has just been issued by R. G. LeTourneau, Inc.

Action shots and cut-out photos of integral parts of the machine illustrate how and why it gets more work done, cuts weather delays, reduces maintenance, speeds push-loading and saves time and money on the job to job moves.

Its fingertip electric control system, instant shift transmission and torque converter, and big tire features are colorfully illustrated in numerous photos and diagrams.

Those interested in this tool may obtain this booklet by requesting Bulletin TD-216 from Advertising Department, R. G. LeTourneau, Inc., Peoria, Illinois. It will be sent without charge.

● Development of a new instrument that will continuously sample the atmosphere of coal mines for methane gas, has been announced by Mine Safety Appliances Co.

The instrument, a combination analyzer and alarm, will be shown at the American Mining Congress Coal Show in Cleveland, May 11 through 14.

Designed primarily for use in mine ventilation systems, the instrument takes samples of return air and automatically analyzes them to detect presence of methane gas. It can sound an alarm, visible and audible, when the predetermined concentration of methane is present in the sample.

Methane gas, being colorless, odorless and tasteless, is the product of decomposition of organic matter. Pockets of this highly explosive gas may be encountered in coal seams, both bituminous and anthracite.

When methane explodes, the concussion shakes loose any coal dust present. This may ignite and set off a chain reaction or wide propagation of the blast. Most modern coal mines, however, use equipment to spray rock dust on underground roof, wall and floor to prevent propagation of a coal dust explosion. Finely ground limestone, when mixed with the coal dust, neutralizes the combustibility of the coal dust in direct proportion to the amount of limestone dust added.

The new detecting instrument is based upon the same electrochemical theory used in other types of gas detection and alarm equipment developed by MSA. The atmospheric sample flows over a heated platinum wire filament which forms part of a balanced electrical circuit.

Any methane present is burned on the wire. This increases the temperature and the electrical resistance of the wire, causing the circuit to become unbalanced.

The degree of unbalance of the electrical circuit is in direct proportion to the concentration of methane in the sample. When a predetermined concentration of methane—below the explosive range—is detected, an alarm circuit is closed automatically.

This new instrument is intended to supplement small hand-operated, battery-powered Methane Detectors and Testers, and the familiar flame safety lamps face workings, break-throughs, air courses and haulageways.

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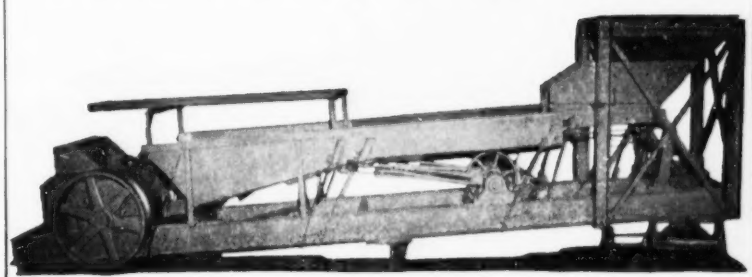
PORTABLE
COAL PREPARATION UNITS



(Patent Pending)

• Comprised of hopper, feeder, screen, picking table and single roll crusher. Capacity—125 or 150 tons per hour. Large heavy-duty Timken double-row roller bearings in the eccentrics and pillow blocks. Over-size Torrington spherical roller bearings in the crusher. The crushers are adjustable from ¾" to 10" opening. Screened coal over the picking table is diverted by a flap-gate to the crusher or mixed with the slack for mine-run. The screen has a snappy action, resulting in efficient screening.

The picking table has a smooth motion which allows selective picking of the impurities which are disposed of in the trough running over the center of the picking table.

The unit is equipped with magnetic starters and push-button controls, 10 to 15 HP motor on the crusher, 5 HP motor on the screen and picking table. It can be readily transported from one location to another on a standard long-wheelbase truck, with minimum cost for moving and erecting.

When used in conjunction with a belt or chain conveyor, the unit can be adapted to various arrangements for handling the coal from the trucks or mine cars, through the cleaning unit, to the railroad cars or bins.

The use of oversized anti-friction bearings throughout these two unit sizes insures trouble-free operation, with low power and maintenance costs.
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● Election of J. T. Ryan, Jr., as president of the world's largest safety equipment manufacturing firm was announced here by the directors of Mine Safety Appliances Company.

Mr. Ryan succeeds George H. Deike, Sr., who was named to the post of chairman of the board.

Mr. Ryan is the son of the man who, with Mr. Deike, founded the concern in 1914. Inititally, the company served only the mining industry but today its products are used by virtually every industry, municipalities and the armed forces.

Mr. Ryan was graduated from Pennsylvania State College in 1934 and received an M.B.A. degree at Harvard. He began his business career as a sales engineer with the company in 1936. In 1948 he was elected to the board of directors and named executive vice president.

Recently, Mr. Ryan received the 1953 Duquesne University Management Award for "leadership in management," presented by the Duquesne Chapter, Society for the Advancement of Management.

Mr. Deike received his B.S. degree in Mining Engineering at Pensylvania State College in 1903 and, in 1948, was awarded a graduate degree of Engineer of Mines by the college. He had been president of Mine Safety Appliances Company since the firm was founded nearly 39 years ago.

He is a member of many engineering and safety organizations, including the Mine Inspectors' Institute of America, the American Institute of Mining and Metallurgical Engineers, Coal Mining Institute of America and the Mine Rescue Veterans' Association.

● George E. Nettels, Vice President and Director of the Pittsburgh and Midway Coal Mining Co., died at his home in Pittsburg, Kansas as the result of a heart attack. Mr. Nettels had served as a member of the NCA Land Use Committee and was President of Southwestern Coal Operators Association in 1950-1951. He had been engaged in coal mining since 1922, folowing his graduation from the University of Kansas in 1920 where he was captain of the football team.

Allis Chamber Hoist Type Motor, 700 HP 720 RPM 2300 V 3 ph 60 cyc. New (not used) a baragin.

West House 500 KW M. G. Set 250 Volts.

Gardner-Denver 500 C.F.M. Air Compressor, Deisel Driven, Rubber tired, good as new.

Clarkson 24 BB loading machine, permanent plate.

G. E. 6 ton Coble reel and 10 locos. 43" Ga.

2-Drum Hoist complete with G. E. 200 HP motor and G. E. Control Panel.

Mine Tipple complete 54'x50' shakers and 50 HP motor. Marcus Drive complete. Jeff Conveyor 75'x31½'—Feeder complete with 5 HP motor—Loading Boom 54'x32'.

Irwin 8-Wheel, all steel 19½ ft. long, 46 in. high, 72 in. wide, 32 men max. cap.

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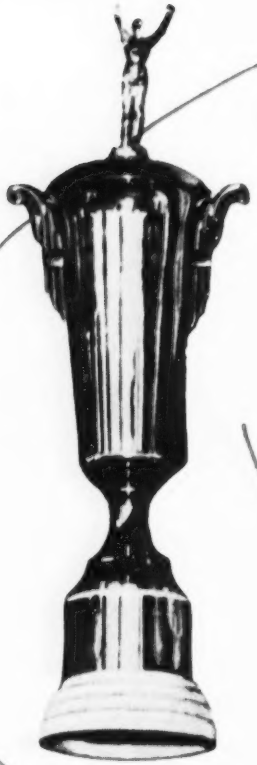

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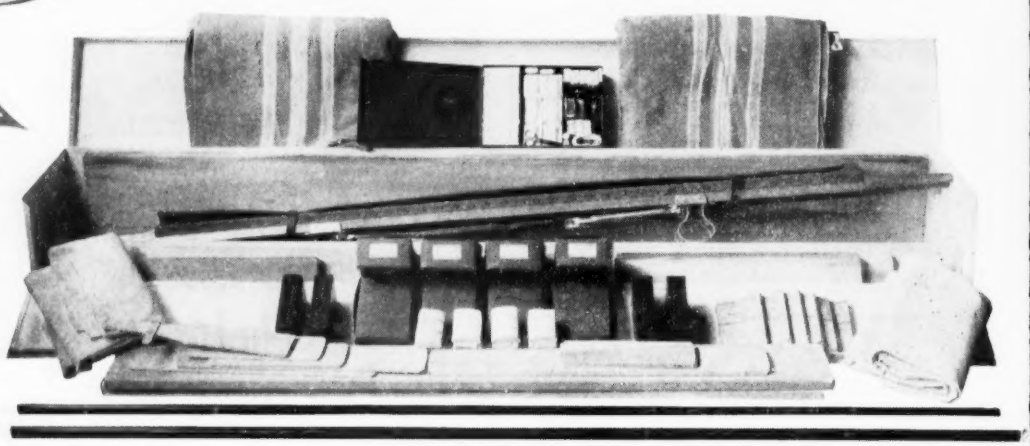

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- 2 Single Wool Blankets
- 6 1 yd. Packages Plain Gauze
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- 1 1 oz. bt. Aromatic Spirits of Ammonia
- 1 Horn Spoon
- 6 Paper Drinking Cups
- 1 Metal Box for dressings
- 1 Set of 18 Wood Splints
- 1 Pair 4" Bandage Scissors
- 2 Army-Type Tourniquets
- 48 40" Triangular Bandages, unsterilized
- 12 1" Compress Bandages, unsterilized
- 12 2" Compress Bandages, unsterilized
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- 4 Wood Blocks for head applications
- 6 U. S. Bureau of Mines First Aid Manuals
- 2 Padlocks
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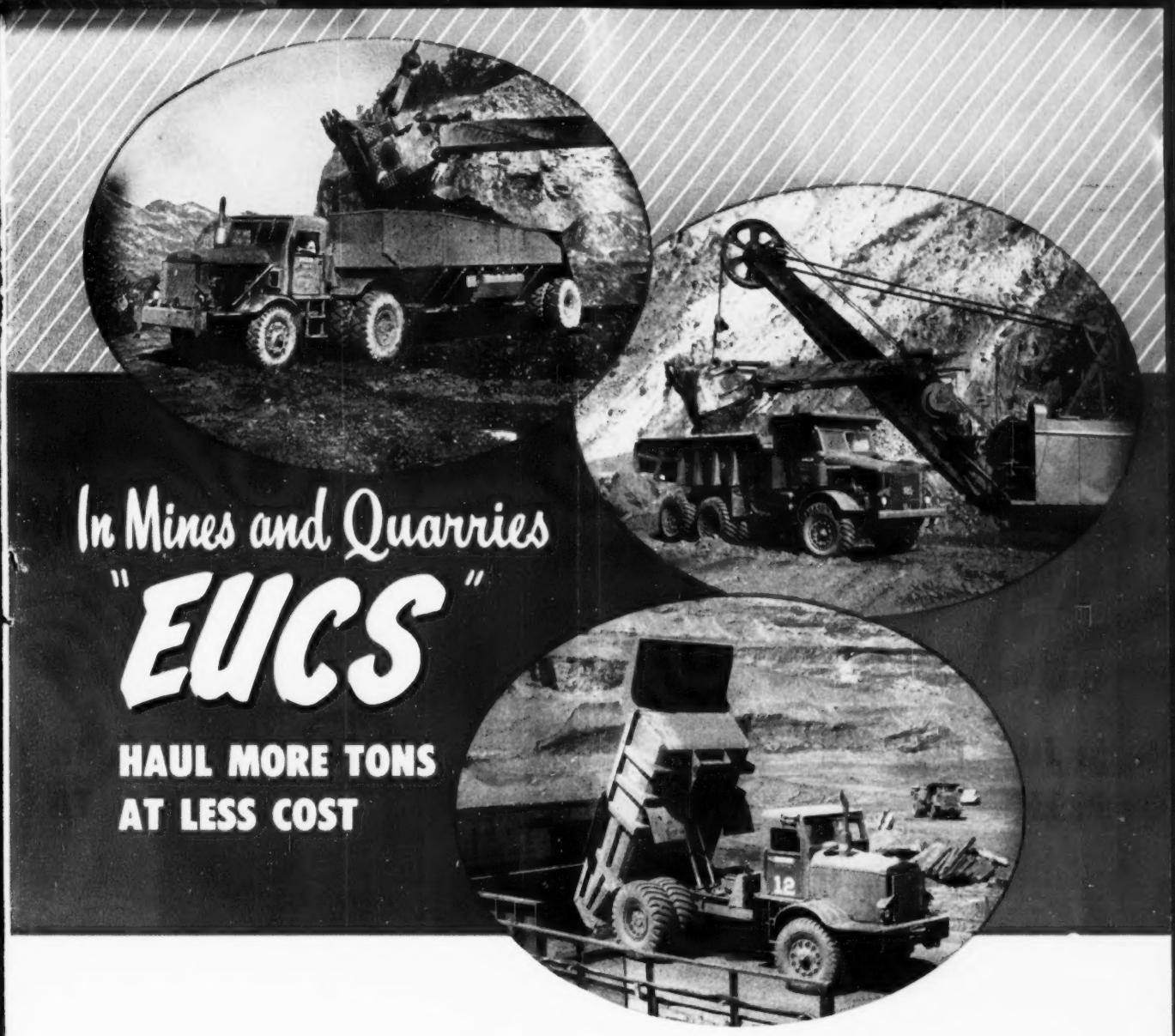

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